Installation and User Guide
Legal Notices

Autodesk® Flame® Premium 2013

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Architectural overview

Autodesk Burn is a Linux-based network processing solution.

The workflow between the components on a background processing network

Functionality

- Used with for Autodesk Inferno, Autodesk Flame, Autodesk Flint, Autodesk Flare, Autodesk Smoke, and Autodesk Backdraft Conform.
- Does imaging processing which frees a workstation for more creative tasks.
- Render nodes can be equipped with GPU-accelerated graphics cards are capable of processing complex jobs, such as floating point jobs.
- Render nodes can be networked with a fast network connection such as InfiniBand technology.
- Can use the Sparks API to port your custom Autodesk Developer Network Sparks plug-ins to the Linux environment.
Components

**Render Client** An application (the render client) that sends jobs to the background processing network. The application could be Inferno, Flame, Flare, Flint, Smoke, and Backdraft Conform.

**Backburner Manager** The hub of the background processing network. The render client submits jobs to Backburner Manager, which distributes them to the render nodes available on the network, according to the job type. Backburner Manager runs as a service on Windows, and as a daemon on Linux and Mac OS X.

**Render Node** This is a system that hosts the Burn Processing Engine. Backburner Server assigns jobs to it. Render nodes use common network protocols like TCP/IP and/or Autodesk Wire. A render node’s ability to process certain types of jobs depends on its hardware capabilities. Render nodes without GPU-accelerated graphics cards cannot process jobs that require a GPU (such as floating point jobs). They can only process jobs in software mode, using the OSMesa API. Render nodes equipped with GPU-accelerated graphics cards can process both jobs that require a GPU and OSMesa jobs.

**Backburner Monitor** This is the user interface for the background processing network. Backburner Monitor runs as an application on Windows systems, and as a Web application on Linux and Mac OS X systems. The Web application can be accessed through a Web browser from any computer on your network. Either version allows you to view and control jobs currently being processed. Jobs in the background processing network can be stopped, restarted, reordered, archived, or removed. You can also monitor the overall health of the background processing network and identify any render nodes that are not working. There is also a Backburner Monitor in Autodesk WiretapCentral.

**Backburner Server** Runs on each render node. It accepts commands from Backburner Manager to start and stop the Processing Engine for the assigned processing tasks on the render node.

**Burn/Backburner Plug-in** Provides the communication link between the Backburner Server and the Burn Processing Engine. Each Autodesk application uses its own plug-in to communicate with its Processing Engine via Backburner. This architecture allows multiple Autodesk applications to share the same render node for a variety of background processing tasks, such as rendering 3D models or transcoding media between video formats. There are separate Burn/Backburner plug-ins for GPU-enabled render nodes and for render nodes without GPUs. The Burn installation script detects the presence of a GPU in the render node, and installs the appropriate plug-in.

**Processing Engine** This is the process that processes frames from jobs submitted from render clients. Specifically, this refers to the Burn application that processes frames from jobs submitted from Inferno, Flame, Flint, Smoke, or Backdraft Conform. The Processing Engine is installed on each render node. By installing multiple processing engines on a render node, the render node is able to process jobs from different clients.

**Wire** Enables the high-speed transfer of uncompressed video, film, and audio between Autodesk systems, over TCP/IP and InfiniBand networks. Render nodes use Wire to transfer source frames from the render client, and to return the processed frames back again. Wire is only required for applications that use Burn.
Installation or upgrade workflow

You can either set up a new system from nothing, or upgrade an existing one. Nodes purchased from Autodesk ship with the correct distribution Linux installed and configured. You must (re)install Linux if: your Linux version is too old. You had to replace the system disk. If you must replace the hard disk of your license server system, you need to obtain a new license. Contact Customer Support for assistance.

**Installation workflow**

1. Check you meet the System requirements (page 5). If doing a fresh install or your Linux is outdated, Install Linux (page 7).
2. Install and configure Burn (page 11).
3. License your software (page 19).
4. Run the software (page 23).

**Upgrade workflow**

1. Check you meet the System requirements (page 5).
2. Install the DKU (page 11).
3. Install and configure Burn (page 11).
4. Upgrade the Visual Effects and Finishing workstations to the same version as the version of Burn you are about to install. Each version of Burn is compatible with only one version of Autodesk Visual Effects and Finishing applications. See the Autodesk Visual Effects and Finishing Installation and Configuration Guide or the Autodesk Smoke for Mac OS X Installation and Licensing Guide for information on upgrading the applications.
5. Install the Burn software on each node.
6. Run the software (page 23).

**Follow this workflow for a fresh install or when you need to reinstall or upgrade the OS.**

1. Check you meet the System requirements (page 5). See your hardware vendor documentation for information on configuring the hardware and connecting the node to your network.
2. Determine the distribution and version of Linux required for your hardware and for the current version of Burn. See the table in Install Linux. If the required Linux distribution for your hardware is CentOS, download the CentOS CD or DVD image from www.centos.org.
3. Add the Autodesk kickstart file to the DVD or CD1 of your CentOS distribution. See Prepare the CentOS disc (page 8). This step is not necessary if you are installing the Autodesk distribution of Red Hat Enterprise Linux on a node purchased from Autodesk.
4. Install the required distribution of Linux. See Install Linux (page 7).
5 Perform the tasks in Configure Linux (page 8).

6 Install the required version of the Discreet Kernel Utility (DKU) on each node. Refer to the Release Notes for the required version and NO LABEL for installation instructions.

7 Upgrade the Backburner Manager system on your background processing network to the current version. See Installing Backburner Manager (page 12).

8 Upgrade the Visual Effects and Finishing workstations to the same version as the version of Burn you are about to install on the nodes. Each version of Burn is compatible with only one version of Autodesk Visual Effects and Finishing applications. See the Autodesk Visual Effects and Finishing Installation and Configuration Guide or the Autodesk Smoke for Mac OS X Installation and Configuration Guide for information on upgrading the applications.

9 Install the Burn software on each node. Configure each node to connect to Backburner Manager. See Connect the node to Backburner Manager (page 13).

10 Optional: Disable local Stone and Wire I/O on each node to improve performance. See Disable local Stone and Wire I/O on a node (page 15).

11 Optional: Group Burn nodes into groups to manage them more efficiently. See www.autodesk.com/backburner-documentation for instructions on using Backburner Web Monitor to create node groups.

12 License your software (page 19). Re-licensing is not necessary if you are upgrading to a service pack of the same software version or to a service pack of the same extension.

13 Run the software (page 23).

### Install the Smoke for Mac distribution of Burn

Two distributions of Burn 2013 cannot be installed on the same node. However, either distribution can process jobs sent from a Mac or Linux product, as long as it is licensed.

The licensing requirements for the Smoke for Mac OS X distribution of Burn are different from the Linux Visual Effects and Finishing distribution.

1 Install and license Smoke for Mac and the Network License Manager. See the Autodesk Smoke Installation and Licensing Guide. Note the Smoke for Mac license server name and host ID.

2 If necessary, set up Burn hardware and install the operating system.

3 Install and configure Burn. During installation, enter the license server name and host ID in /var/flexlm/autodesk.lic.
You can run the current version of Burn on render node hardware purchased from Autodesk and running Red Hat Enterprise Linux, or on third-party nodes running CentOS, as long as they meet the minimum requirements below. Installing Burn on Visual Effects and Finishing workstations is not supported. Install Burn only on dedicated render nodes.

### Hardware requirements for nodes not purchased from Autodesk

<table>
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<tr>
<th>Component</th>
<th>Minimum</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Two single-core, or one dual-core 64-bit processor, such as AMD Opteron or Intel Xeon</td>
<td>Two quad-core 64-bit processors, such as the Intel Xeon E5472 CPU at 3.0 GHz</td>
</tr>
<tr>
<td>Memory</td>
<td>8 GB or higher</td>
<td>Same amount of memory as the Visual Effects and Finishing workstation</td>
</tr>
<tr>
<td>Hard Disk</td>
<td>120 GB or higher SATA, Ultra-SCSI 320, SAS, or IDE drive. The system disk must be a single, physical hard disk drive. It cannot be a logical volume from an array of disks.</td>
<td></td>
</tr>
<tr>
<td>Network card</td>
<td>On-board Gigabit Ethernet adapter</td>
<td>InfiniBand card, if you want to run Burn and Autodesk Incinerator on the same render node</td>
</tr>
<tr>
<td>GPU-accelerated Graphics Card</td>
<td>None. Nodes without a GPU-accelerated graphics card cannot render jobs that require a GPU, such as floating point jobs.</td>
<td>A card from either of NVIDIA Quadro FX 3800 or better, or NVIDIA Quadro 4000 or better</td>
</tr>
</tbody>
</table>

### Linux requirements

To see which Linux version a system has installed, open a terminal and run: `cat /etc/redhat-release`.

<table>
<thead>
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<th>Hardware Platform</th>
<th>Linux Version</th>
</tr>
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<tr>
<td>HP ProLiant DL160se G6</td>
<td>Custom Autodesk distribution of Red Hat Enterprise Linux Desktop 5.3 with Workstation Option</td>
</tr>
<tr>
<td>HP ProLiant DL160 G5 or HP ProLiant DL140 G3</td>
<td>Custom Autodesk distribution of Red Hat Enterprise Linux WS 4, Update 3</td>
</tr>
<tr>
<td>Hardware Platform</td>
<td>Linux Version</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Nodes not purchased from Autodesk</td>
<td>On new nodes, use CentOS 5.3. On already-configured nodes, you may keep using Fedora Core or CentOS 4.6 on already configured nodes.</td>
</tr>
</tbody>
</table>
Install Linux

Prerequisites:

- Mouse, keyboard and graphics monitor are connected, and the graphics monitor is powered on.
- If you are using a KVM switch, it is switched to the system on which you want to install Linux.

To do a fresh install of Linux:

1. Insert the appropriate disc:
   - For nodes that were not purchased from Autodesk, use the CentOS disc that you added the Autodesk kickstart file to.
   - For nodes purchased from Autodesk, the DVD containing the customized Autodesk distribution of Red Hat Enterprise Linux is included with your shipment. The customized Autodesk distribution installs certain Linux packages that are required by Autodesk applications but are not installed by the commercial distribution of Red Hat Enterprise Linux. Even though your shipment may also include the disc set for the commercial distribution of Red Hat Enterprise Linux, do not install the commercial distribution. Your software only works on the custom Autodesk distribution of Red Hat Enterprise Linux.

2. Restart the system. The system should boot to the Linux installation disc. If it does not, check that the optical drive is set as the primary boot device in the BIOS.

3. At the boot prompt in the Red Hat Linux or CentOS installation menu, run one of the following commands:
   - `burn`: A Burn node using the Autodesk custom DVD of Red Hat Enterprise Linux
   - `linux ks=cdrom`: A Burn node using CentOS with the Autodesk kickstart file

   The command launches the Linux installation. The system loads drivers. The installer guides you through the rest of the process. If you experience problems with the graphical Linux installer, reboot your computer and run the installer in low resolution VESA mode by running the command `linux ks=cdrom xdriver=vesa`. If you still experience problems, reboot again and start the installer in text-only mode by typing `linux ks=cdrom text`.

4. If prompted, follow the prompts to initialize the system disk.

5. Insert the remaining Linux distribution discs if prompted. The remainder of the installation process is automated. If the installation drops into text mode or to a blank screen just before completing, press CTRL+ALT+F6 to return to graphical mode. At this point, the installation should be finished, and you should see the “Congratulations...” message and the Reboot button.

6. Eject the disc and reboot the system. If after rebooting, Linux fails to start in graphical mode on the node, log in as root at the text mode login prompt, and Install the DKU (page 11). The default root password for a Linux installation on a node is password.
Prepare the CentOS disc

Before installing CentOS distro for non-Autodesk hardware, you must add the Autodesk kickstart file to the DVD or first CD of your distribution so the Linux installer to install some packages. The custom Autodesk DVD of Red Hat Enterprise Linux for Autodesk hardware already contains the Autodesk kickstart file.

To copy the kickstart file to the disc. Use the new disc as the DVD or first CD of the CentOS distribution you plan to install on the node.

1 On a computer running Linux and with a CD or DVD burner, log in as root.
2 If you did not download your distro as an iso image:
   1 Insert the DVD or first CD of your CentOS distribution into the drive. You do not need to mount it.
   2 In a terminal, get an ISO image of the disc by typing: dd if=/dev/ <CD/DVD device> of=/<destination path for the extracted ISO image>. For example: dd if=/dev/cdrom of=/tmp/ Centos5.iso
3 Eject the disc.
3 From the installation package, run dist/kickstart/build_kickstart_cd to add the kickstart file to the ISO image of your Linux distribution DVD or first CD. For example:
dist/kickstart/build_kickstart_cd RHEL5_CentOS5_kickstart.cfg /tmp/Centos5.iso /tmp/Centos5_KS.iso.
4 Do cdrecord -scanbus to get the address of your CD or DVD writer and use it to address the writer.
5 Burn the new ISO image to a blank disc. For example: cdrecord -v speed=2 dev=0,4,0 /tmp/Centos5_KS.iso.

Configure Linux

1 Change the default root password by logging in as root (default password is password), and running the passwd command.
2 If you did not receive your render node from Autodesk, check for firmware or driver updates for your hardware after CentOS is installed. Refer to the CentOS and/or hardware manufacturer Web sites to ensure you have the correct firmware and drivers.
3 The automated Autodesk installation sets the time zone to North American Eastern Standard Time (EST) by default. If necessary, set the time zone for your location.
4 Configure basic network settings (page 8).
5 Install the DKU (page 11).
6 Configure an InfiniBand card (page 10) (optional).
7 Optionally enable headless boot for nodes equipped with Quadro 4000 GPUs.

Configure basic network settings

Login as root to edit the files described below in a text editor, and reboot the system for the new configuration to be used.

You'll need the following from your network administrator:
- A unique static IP address and host name for your system
The network gateway IP address.

- The subnet mask of your network.
- DNS server IP address(es).

/etc/sysconfig/network

Sample snippet from /etc/sysconfig/network.

```
NETWORKING=yes
HOSTNAME=burn1
GATEWAY="10.1.0.25"
```

The GATEWAY value is used if no GATEWAY is defined in a network port's configuration file.

/etc/resolv.conf

Sample snippet from /etc/resolv.conf

```
nameserver 192.9.201.1
```

/etc/hosts

You may need to edit the loopback setting which may look like 127.0.0.1 vxhost.localhost.localdomain localhost by default. Optionally add hostname / IP address pairs for other workstations on your network.

Sample snippet from file:

```
127.0.0.1 localhost.localdomain localhost
192.168.0.100 burn_02
```

/etc/sysconfig/network-scripts/ifcfg-eth

Edit /etc/sysconfig/network-scripts/ifcfg-eth, where n specifies the ethernet port number, usually 0 for the first on-board port. If your workstation has an add-on ethernet card installed, the Linux operating system may assign ports eth0 through eth3 to the add-on card. In such a case, the on-board Ethernet ports become eth4 and eth5.

Optionally set the GATEWAY if not set in /etc/sysconfig/network.

Sample snippet from file:

```
DEVICE="eth0"
BOOTPROTO="static"
IPADDR="192.168.1.100"
NETMASK="255.255.0.0"
ONBOOT="yes"
GATEWAY=192.168.0.1
```

You'll need the following from your network administrator:

- A unique static IP address and host name for your system
- The network gateway IP address.
- The subnet mask of your network.
- DNS server IP address(es).
Configure an InfiniBand card

To use the render node in an InfiniBand-connected background processing network, it must be equipped with an InfiniBand network adapter.

The precompiled QuickSilver (QLogic) InfiniServ 9000 HCA adapter drivers for the Red Hat Enterprise Linux kernel are included in the `dist/ib` subdirectory of the installation package.

If you are using CentOS, you need to manually compile the InfiniBand driver for your version of the Linux kernel. The source files for the driver are located in the `src/infiniband` subdirectory of the latest DKU installation package. Refer to your CentOS documentation for information on compiling software. Refer to the README file located inside the driver tar file for instructions on how to install the driver and configure your InfiniBand interface.
Install and configure Burn

To install or upgrade Burn and Backburner:

1. Install the DKU (page 11) if necessary.
2. Install or upgrade Backburner on the system that will act as the Backburner Manager for submitted Burn jobs. See Installing Backburner Manager (page 12).
3. Install or upgrade Burn on each render node to be used in the background processing network. See Install Burn on render nodes (page 12).
4. Activate each render node so it can receive and process jobs from Backburner Manager. See Connect the node to Backburner Manager (page 13).
5. Your Autodesk Visual Effects and Finishing application can use Burn by default. No additional software is required. Configure workstations for Burn (page 13) where applicable.
6. If this is the first time you installed Burn on this render node, enable multicasting. See Configure multicasting (page 14).
7. Optional: Install additional fonts on the render node, if necessary. See Install additional fonts (page 15).
9. Optional: Group Burn nodes into groups to manage them more efficiently. See www.autodesk.com/backburner-documentation for instructions on using Backburner Web Monitor to create node groups.
10. Optional: If you are also running versions of Burn earlier than 2.0 on the same render node, synchronize the version of the Burn client and Burn server with the version of the Autodesk Visual Effects and Finishing application you are running. See Run multiple versions of Burn on the same node (page 15).

Install the DKU

Before installing your software, you must install the required version of the DKU on all nodes, whether Red Hat or CentOS.

See the Release Notes for the required DKU version, and check whether you have the required version by running as root in a terminal: head -n1 /etc/DKUversion.

For major releases, the DKU is available on the application DVD or as a download from Autodesk. For extensions and service packs, the DKU is only available for download. The download link is provided in the release announcement you received from Autodesk.

1. Mount the USB key or extract the tar file to access the DKU installation directory.
In the DKU installation directory run the DKU installation script: INSTALL_DKU.

If you installed from a disc, eject the disc.

Reboot the system.

**Prepare the installation media**

Check the release announcement to find out on what media the installers are available.

**Major releases are distributed on a USB device. To mount a USB device:**

- Attach the device. Log in to the terminal as root.
- Use the `dmesg` command to output something like `sdf: sdf1` to list a recent device connected. Or list the devices attached to your system with the command: `fdisk -l | grep "/dev/sd"`. The device assigned to the USB device should look similar to `/dev/sds` or `/dev/sde`.
- On a fresh Red Hat installation, automount is enabled, but execution from the device is disabled. So you must unmount the USB drive with `eject /<mountpoint>` or `eject /dev/<device id>`.
- Create a mount point directory for the disk with `mkdir /mnt/usbdisk`.
- Mount the device with `mount -o shortname=winnt /dev/<device>1 /mnt/usbdisk`. Or from the GUI browse to `/dev`, right-click the USB device, and choose Mount.

**Software is sometimes distributed as tar files. To extract from a tar file:**

1. In a terminal, as root, use the `md5sum` command to verify the checksum matches the md5sum listed in the checksum file.
2. Extract the from the tar archive with `tar -zxvf filename.tar.gz`.

**Installing Backburner Manager**

Backburner Manager acts as the communications hub for the background processing network.

If you create a background processing network that serves a single Visual Effects and Finishing workstation, you can run Backburner Manager on the workstation itself. Backburner components are installed automatically with Visual Effects and Finishing applications.

If the background processing network serves multiple workstations, it is recommended to run Backburner Manager on a dedicated machine on your network. Backburner Manager works on Windows, Linux, and Mac OS X systems.

Refer to the Autodesk Backburner Installation Guide for detailed system requirements and instructions on installing and configuring Backburner Manager. You can find this document at [www.autodesk.com/backburner-documentation](http://www.autodesk.com/backburner-documentation).

**Install Burn on render nodes**

Install Burn on each dedicated render node. You can install Burn2013 alongside earlier versions of Burn. Installing Burn on Visual Effects and Finishing workstations is not supported.

1. As root, in a terminal, Log in to the render node as root, and open a terminal. Prepare the installation media (page 12) to access the installer.
2 From the installation directory. Run the installation script: 

```bash
./INSTALL_BURN
```

The Burn and Backburner Server packages are installed.

3 If you are installing the Smoke for Mac OS X edition of Burn, you are prompted to enter the license server name or address and the license server MAC address. For more information on licensing Smoke for Mac applications, see the *Autodesk Smoke Installation and Licensing Guide*.

4 If graphics are enabled, the following prompts appear:
   - Do you want to automatically run the Backburner Manager on this machine? Click No.
   - Do you want to automatically run the Backburner Server on this machine? Click Yes
   - Do you want to enter the manager for this server? Click Yes.

5 In the `manager.host` file enter the host name or IP address of your Backburner Manager. Otherwise, close it without saving. You may edit this file later. See *Connect the node to Backburner Manager* (page 13).

### Connect the node to Backburner Manager

With Burn installed, validate the connection to Backburner Manager for each render node on the network. You do not need to perform this procedure if you already specified the correct manager host name when installing Burn on each node.

1 On the render node, log in as root on the render node and open for editing
   ```bash
   /usr/discreet/backburner/cfg/manager.host
   ```

2 Replace the text in the file with the host name or IP address of the system running Backburner Manager. It must be the same as the one specified in the configuration of the Visual Effects and Finishing application. `manager.host` cannot contain comments.

3 Save the file and restart Backburner Server on the render node with
   ```bash
   /etc/init.d/backburner_server restart
   ```

### Configure workstations for Burn

Autodesk Visual Effects and Finishing workstations can use Burn if they are on the same version and have been configured by settings four parameters. When changing parameters, restart the software for them to be used.

**Location of parameters**

- For Linux, edit the initialization file 
  ```bash
  /usr/discreet/<product_home>/cfg/init.cfg
  ```
- For Mac, run the Smoke Setup utility which is usually in
  ```bash
  Applications/Autodesk/Smoke/Smoke Utilities.
```

**Parameters**

- **BackburnerManagerHostname** *(Linux) Manager Hostname (Mac)* The hostname or IP address of the Backburner Manager system that will handle background jobs submitted by the workstation.

- **BackburnerManagerPriority** *Job Priority* The priority for jobs submitted by the workstation to Backburner Manager, from 1 (most important) to 100. With the default setting, all jobs are given the same priority, and Backburner Manager manages jobs and network resources automatically.

**WARNING** Changing this setting is not recommended and may compromise access to the background processing network for other users in your facility.
BackburnerManagerGroup Server Group Specifies a server group (a preset group of render nodes) used to process jobs submitted by the application. By default, Backburner Manager assigns a job to all available render nodes capable of processing it. If you have a dedicated group of render nodes for processing jobs, set the value to the name of the render node group. See the the Backburner User Guide for information on creating groups.

BackburnerManagerGroupCapability Group Capability Enables or disables the submission of jobs that require a GPU (such as floating point jobs) to the background processing network. Configure this according to the GPU capabilities of the nodes in your background processing network:

- Software: none of the nodes in your background processing network is equipped with a GPU. The application will not send jobs that require a GPU to the background processing network, but only jobs that can be processed in software mode (using OSMesa) by the render nodes.
- GPU: all the nodes in your background processing network are GPU-enabled. The application will send all jobs to the GPU-equipped nodes in the background processing network, even if some jobs do not specifically require a GPU node. The GPU-equipped render nodes will render jobs that require a GPU, as well as OSMesa jobs. If your background processing network also contains nodes without a GPU, and this setting is used, all jobs are sent only to GPU-equipped render nodes, and the nodes without a GPU are never used.
- Hybrid: your background processing network contains a mix of nodes with GPUs and without GPUs. The application will send all jobs to the background processing network, and Backburner Manager will distribute each job to the appropriate type of render node. Jobs that require a GPU are sent only to GPU-equipped nodes, while jobs that do not require a GPU are sent to any available render node (GPU or non-GPU), to be processed in software mode. Use this setting only if you are sure that at least one node in your background processing network is equipped with a GPU. Attempting to submit a job that requires a GPU to a background processing network with no GPU-enabled nodes results in the job being stuck in the queue indefinitely.

Configure multicasting

Enable multicasting in Stone and Wire. Unnecessary if upgrading an existing installation of Burn.

1. Open the `/usr/discreet/sw/cfg/sw_probed.cfg` configuration file on the render node in a text editor.
2. Set `SelfDiscovery` to `Yes`. Now `sw_probed` runs in self-discovery mode and it will automatically probe the network for other systems. This is set to `Yes` by default when Stone and Wire is installed on the render node.
3. The `Scope` parameter defines the scope for the multicast. This parameter setting must be the same for all machines on your network.
   - For networks with one subnet, set to `LinkLocal`.
   - For networks with subnets, use a value that is appropriate for your requirements and router configuration, either `OrganizationLocal`, or `GlobalWorld`.
4. If the workstations and Burn nodes in your facility are on separate networks connected through routers, use the `ttl` parameter in the file to specify the number of router hops for a multicast. Burn-related transfers across multiple routers may cause bottlenecks at network bridges, especially with jobs involving film frames. Using the `ttl` parameter may reduce multicast-related traffic and improve general network performance in your facility. Consult your network administrator for guidance on setting the appropriate values for your network.
5. Save and close the `sw_probed.cfg`.
6. Restart the `sw_probed` daemon: `/etc/init.d/stone+wire restart`.

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Install additional fonts

When you install Burn, the same fonts that are installed by default with your Autodesk Visual Effects and Finishing application are also installed on the render nodes.

However, if you installed additional fonts on the workstation that are not provided with your application, you must also install those fonts on each render node. Contact your third-party font supplier(s) for information about Linux support for those fonts.

Ensure any 3D Text fonts used with Action nodes in the Batch setups you submit to Burn are installed.

Disable local Stone and Wire IO on a node

If the Burn render node has a slower connection to a shared storage device (such as a SAN) than the Visual Effects and Finishing workstation, it is preferable for Stone and Wire I/O operations to be performed on the Visual Effects and Finishing workstation, rather than on the render node.

To disable local Stone and Wire I/O operations:

1. In a terminal on the Burn render node, as root, stop Stone and Wire by typing `/etc/init.d/stone+wire stop`.
2. Open for editing `/usr/discreet/sw/cfg/stone+wire.cfg`.
3. Set `DisableLocalIO=True` to true.
4. Save and close the configuration file, then restart Stone and Wire: `/etc/init.d/stone+wire start`.

Run multiple versions of Burn on the same node

Each version of an Autodesk Visual Effects and Finishing application includes its own version of Burn, and each version of Burn is compatible with only one version of Autodesk Visual Effects and Finishing applications. Because your facility may have different versions of Autodesk Visual Effects and Finishing applications running with their corresponding version of Burn, you can run different versions of Burn on the same machine.

Assessing Compatibility Between Client and Server Versions

For Burn versions 2.0 and later, your Visual Effects and Finishing application sends jobs directly to the background processing network, removing the need to synchronize the client with the server. For Burn versions earlier than 2.0, you must synchronize the version of the Burn client and Burn server with the version of the Autodesk Visual Effects and Finishing application you are running.

<table>
<thead>
<tr>
<th>Burn Client Version</th>
<th>Burn Server Version</th>
<th>Visual Effects and Finishing Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burn client 1.0.x</td>
<td>Burn 1.0.x</td>
<td>Inferno 5.3.2, Flame/Flint 8.3.2</td>
</tr>
<tr>
<td>Burn client 1.5</td>
<td>Burn 1.5</td>
<td>Inferno 5.5, Flame/Flint 8.5</td>
</tr>
<tr>
<td>Burn client 1.6</td>
<td>Burn 1.6</td>
<td>Inferno 6.0, Flame/Flint 9.0, Fire 6.5, Smoke 6.5</td>
</tr>
</tbody>
</table>
Managing Multiple Burn Servers on a Render Node

You can have multiple versions of the Burn server installed on a render node to handle jobs from different Burn clients. For example, you can run the Burn 1.6 and Burn2013 servers to allow the same render node to handle jobs from the Burn 1.6 client used by Flame 9.0 and Smoke 6.5, as well as jobs from other Autodesk applications that use Burn 2013.

Use the `select_burn` script to help you manage the Burn servers running on a render node. The script is in the `bin` directory of burn, for example `/usr/discreet/burn_2011/bin/select_burn`. `select_burn -h` gives script usage.

**List installed Burn server versions:**

1. On the render node, log in as root and open a terminal.
2. Run for example `select_burn -l` to list the Burn server versions that are installed on the render node and their current status. Servers listed as Enabled process jobs of their type.

**Select the version of the Burn server used for processing jobs on a node with `select_burn -c <job type, server version>`:**

1. On the render node, log in as root and open a terminal.
3. Test that it’s status is Enabled with `select_burn -l`.

Synchronize a Burn 1.x Client with the Autodesk Application

Autodesk Visual Effects and Finishing applications that used Burn 1.x included a daemon called the Burn client which linked the application with the Backburner Manager. Because a Burn 1.x client can only submit processing jobs to its version of Burn, you must manually change the Burn client if you run different versions of Inferno, Flame, Flint, or Smoke on the same workstation.

If a workstation in your facility is running one of the these applications, perform the following procedure to synchronize the Burn client version with the application. Otherwise, you will be unable to submit Burn jobs from these applications.

- Inferno 5.3.2 to Inferno 6.2
- Flame/Flint 8.3.2 to Flame/Flint 9.2
- Fire/Smoke 6.5 to Fire/Smoke 6.7

To synchronize the Burn client version with its application so that you can use a previous version of Burn with the Autodesk application:

1. Exit the Autodesk application and log in as root on the workstation.
2. Stop the Burn client with `/etc/init.d/burnclient stop`
3. Get a directory listing of `/usr/discreet`. It contains:
   - A sub-directory for the current version of the Burn client.
   - Sub-directories for earlier versions of the Burn client, named `burnclient.previous.<number>`. For example, `/usr/discreet/burnclient.previous.1`
A symbolic link called `burnclient` that points to the directory of the current version of the Burn client.

4. Remove the symbolic link to the current version of the Burn with `rm burnclient`.

5. Create a new link to the Burn client version that you want to run with `ls -s <target directory> burnclient` where `<target directory>` is the name of the sub-directory containing the version of the Burn client you want to run.

6. Start the previous version of Burn with `/etc/init.d/burnclient start`
License your software

You can install Burn without a license, but you must license it before you can use it. Burn uses a “floating” license system, made up of the following components.

1. License Server: A Linux daemon that provides concurrent licenses to Burn nodes on your network as needed.
2. Licensing clients: Each Burn node on the network that requests a license from the License Server.

To license a Burn network:

1. Install the license server software (page 20) if you do not already have a license server in your network.
2. Get license codes (page 19).
3. NO LABEL.
4. Configure nodes or workstations to get a license (page 21).
5. Optionally Change the default port used by the license server (page 21).

Two licensing scenarios

The licensing requirements for the Smoke for Mac OS X distribution of Burn are different from the Linux Visual Effects and Finishing distribution.

- To license Burn for Visual Effects and Finishing Linux workstations, see License your software (page 19).
- For information on licensing the Smoke OS X distribution of Burn, see Install the Smoke for Mac distribution of Burn (page 4).

Two distributions of Burn 2013 cannot be installed on the same node. However, either distribution can process jobs sent from a Mac or Linux product, as long as it is licensed.

Get license codes

NOTE You get your license codes for the Smoke for Mac OS X distribution of Burn when you register Smoke.

To obtain permanent license codes for Burn:

1. Log in as root on the license server system and get the unique Discreet host ID for the system by running: /usr/local/bin/dlhostid.
2 Send the Discreet host ID (including the DLHOST01= part) to the Autodesk Media and Entertainment Licensing Department either by email me.licensing@autodesk.com or by telephone 1-800-925-6442 between 8 AM and 8 PM EST (toll-free in North America). Outside of North America, call 1-514-954-7199.

**Install the license server software**

For the Smoke for Mac OS X distribution of Burn, you use the same license server as the application. See the Autodesk Smoke for Mac OS X Installation and Licensing Guide for information.

The license server is a Linux daemon that provides concurrent licenses to Burnnodes.

You can install the license server on a Burnnode in your network, or on any 64-bit system running Red Hat Enterprise Linux Desktop 5.3 with Workstation Option (64-bit), Red Hat Enterprise Linux WS 4, Update 3 (64-bit), CentOS 5.3, or CentOS 4.3.

For a redundant network license server configuration, you must install the license server software on all three workstations selected as license servers.

To install the license server, as root, run on the ./INSTALL_LICSERV from the software installation directory.

**Create a license file for a remote license server**

After you receive your license codes, edit the /usr/discreet/licserv/licenses/DL_license.dat license file on the license server (or all three servers, if you are configuring redundant license servers), and enter the license codes you received from Autodesk.

The license information contains keywords that identify the license server, as well as the license strings for products or features.

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVER</td>
<td>Specifies the hostname of the license server from which to obtain the license, followed by its dlhostid.</td>
</tr>
<tr>
<td>VENDOR</td>
<td>Specifies the daemon that is serving the license.</td>
</tr>
<tr>
<td>USE_SERVER</td>
<td>Indicates whether the system should obtain its license from a license server.</td>
</tr>
<tr>
<td>FEATURE</td>
<td>License strings for the software and feature entitlements.</td>
</tr>
</tbody>
</table>

**To create the license server file on a license server:**

1 Log in as root to the license server.
2 Navigate to the licenses directory by typing: cd /usr/discreet/licserv/licenses
3 If the file DL_license.dat does not exist in the directory, create it: touch DL_license.dat
4 Open the file DL_license.dat in a text editor.
5 Enter the information provided by Autodesk in this file. It should be similar to the following shortened example:

   **NOTE** If you are setting up redundant a network license, there are three SERVER strings.
Configure nodes or workstations to get a license

Create a licence file on each Burn node so that it can get a license from the license server. Do this even if the server and client are on the same machine.

1. As root, Log in as root, open for editing /usr/local/flexlm/licenses/DL_license.dat. If it doesn’t exist yet, create it.
2. Copy the SERVER, DAEMON, and USE_SERVER lines into the license file. The resulting file should look similar to:

   ```
   SERVER server DLHOST01=25231AEF83AD9D5E9B2FA270DF4F20B1
   DAEMON discreet_l discreet_l
   USE_SERVER
   ```
3. Repeat for each node.

Change the default port used by the license server

To avoid conflicts with other applications or license servers in your facility, you may need to change the default port setting used by the license server, or license servers in the case of a redundant configuration. This requires a minor change to the DL_license.dat file on your license server(s), as well as on every Burnnode.

To change the default port used by a license server:

1. Log in as root to the license server and open /usr/discreet/licserv/licenses/DL_license.dat for editing.
2. Find the SERVER line. By default, no port number is specified at the end of the SERVER line for a single license server and the license server uses default port number in the range of 27000-27009. By default, redundant license servers are set to port 27005.
3. Enter a different port at the end of the SERVER line. The license server can use a default port number in the range of 27000-27009. For example: SERVER server DLHOST01=886C2B75E8E57E4B03D784C3A2100AC0 62222
4. Save and close the file, then verify that the new port settings are correct:

   ```
   /etc/init.d/license_server stop
   /etc/init.d/license_server start
   cat /usr/discreet/licserv/log/license_server.log
   ```

   For redundant license servers, reboot each server in close sequence to properly restart the license system.
5. Look for messages similar to the following examples in the output, and verify that the port numbers are what you requested, e.g.:
15:08:49 (lmgrd) lmgrd tcp-port 62222
15:08:49 (lmgrd) Starting vendor daemons ...
15:08:49 (lmgrd) Using vendor daemon port 12344 specified in license file
15:08:49 (lmgrd) Started discreet_1 (internet tcp_port 12344 pid 5013)

6 Repeat with /usr/local/flexlm/licenses/DL_license.dat for each node, using the same port as the one you set for the license server.
Run the software

Overview

Once Burn is installed and licensed, send jobs from your Autodesk Visual Effects and Finishing applications to the background processing network. The background processing network refers to all the nodes on the physical network that are used for background processing.

The following procedures provide a general overview for using Burn to do background processing and assumes that the network is configured properly, including the TCP/IP settings.

Submitting Jobs to the Background Processing Network

When the Visual Effects and Finishing application is properly configured for Burn, a Burn button appears in the clip library or in various application modules. Click this button to submit a setup, timeline, or clip as a background processing job. Refer to the application help for details.

The Burn button appears when Burn-related settings are configured in the init.cfg file of Linux applications, or in the Smoke Setup utility of Smoke for Mac OS X. However, this button’s appearance does not mean that the background processing network is operational. Always check the status of the network using the Backburner Monitor before submitting jobs to Burn.

Monitoring and Managing Burn Jobs

You can preview results for Burn jobs by viewing the _Burn_ library in the clip library of an Autodesk Visual Effects and Finishing application. As you are previewing your result, the clip may appear semi-rendered. Frames are not processed sequentially, so it is important to wait until the processing tasks are finished and the clip is completely processed.

- The Background I/O window in your Autodesk Visual Effects and Finishing application. See your application help.
- The browser-based Backburner Monitor. See the latest Autodesk Backburner User Guide for details.
- The browser-based Backburner Monitor included in Autodesk WiretapCentral. See the WiretapCentral chapter in your application help for details.

Previewing Results

To preview a Burn result:

1. Open the clip library. See your application help.
2. Open the _Burn_ library. Submitted Burn Jobs appear with a name that identifies the machine, the date and time of the job, as well as the job type. Jobs that require a render node equipped with a GPU contain the string “gpu” in
their name. The _input reel contains jobs and source clips that are sent as input to Burn for processing over the network. The _output reel indicates the rendered result that is copied back to the Linux workstation. A clip labelled PENDING RENDER indicates that the clip is being rendered by Burn.

3 To refresh the view of the rendered result, press the F hot key.
Troubleshooting

Troubleshooting problems with jobs on an Autodesk background processing network can be complex because Burn and Backburner components interact with Windows, Mac OS X, and Linux platforms over the network. Procedure:

1. Shut down and restart all Burn and Backburner components, including:
   - All Autodesk Visual Effects and Finishing applications that submit jobs to Burn.
   - Backburner Manager. See Restart Backburner Manager and Backburner Server (page 25).
   - The Backburner Server running on each node processing Burn jobs. See Restart Backburner Manager and Backburner Server (page 25).

2. In some cases, simply restarting these components is enough to fix problems with Burn. Otherwise, use the remaining steps to diagnose and correct the problem. Verify that the problem with Burn is not being caused by a larger problem with the background processing network, such as a lack of network connectivity. See Troubleshooting the background processing network (page 26).

3. Use the GATHER_BURN_LOGS script to compile and review the Burn and Backburner logs from render nodes on the network. See Review log files (page 30). Reviewing the Burn and Backburner logs helps you see The component of the background processing network that is failing, and the conditions under which the component fails.

4. If these logs indicate that the problems may be due to background processing network components such as Wire networking, use scripts to troubleshoot the background processing network. See Test network components (page 31).

5. If these logs indicate that the problems may be due to memory issues on the render nodes, or if you suspect that the render nodes do not meet the graphics card requirements for a certain job type, see Assess compatibility between jobs and render nodes (page 32).

6. If neither the logs nor the included scripts help you troubleshoot the problem with the background processing network, contact Autodesk Media and Entertainment Customer Support.

Restart Backburner Manager and Backburner Server

Backburner Manager and Backburner Server must be running before you can submit jobs to the background processing network.

These components are set to start automatically with the system they are installed on, thus, under normal circumstances, you do not need to manually start them. However, if you are experiencing issues with Backburner Manager and Backburner Server, perform the following tasks to manually restart these services. Ensure only one Backburner Manager is running on the background processing network at any given time. Otherwise, Burn jobs submitted to the network may not be processed.
Restart Backburner Manager on Linux

To restart Backburner Manager on a Linux system:

1. Log in as root and open a terminal. Check the Backburner Manager daemon is running: `ps -ef | grep -i Backburner`.
2. Start the Backburner Manager daemon: `/etc/init.d/backburner_manager restart`. To view details on the Manager's status, check the backburner log files in `/usr/discreet/backburner/Network/`.

To restart Backburner Manager on a workstation where Smoke for Mac OS X is installed:

2. If Backburner Manager is not running, click Start. Backburner Manager starts. To view details on the Manager's status, run the Console application from `Applications/Utilities`, and look for entries containing `com.autodesk.backburner_manager`.

To restart Backburner Manager on a stand-alone Backburner Manager Mac OS X systems:

1. In a terminal, check that the Backburner Manager service is running: `sudo ps -ef | grep -i backburner`
2. If `backburnerManager` does not appear in the output of the command, restart the Backburner Manager service: `sudo /usr/discreet/backburner/backburner_manager restart`
3. To view details on the Manager's status, run the Console application from `Applications / Utilities`, and look for entries containing `com.autodesk.backburner_manager`, or check the backburner log files in the `/usr/discreet/backburner/Network` directory.

To restart Backburner Manager on a Windows system:

- On the Windows Backburner Manager computer, from the Start Menu, select Programs > Autodesk > Backburner > Manager. Backburner Manager starts and its application window appears. The message “Starting Network Manager” as well as server connection messages are displayed in the window. To view details on the status of Backburner Manager, leave its application window open or view the log files. See the Autodesk Backburner Installation Guide.

To restart Backburner Server:

- Log in as root to each render node. Start Backburner Server with: `/etc/init.d/backburner_server restart`. Backburner Server starts and searches the network for the Backburner Manager application specified in `/usr/discreet/backburner/cfg/manager.hosts`. Once Backburner Manager is found, a message is logged to indicate that Backburner Server has successfully established communication with the Manager. Backburner Manager should also detect the Backburner Server running on each node on the background processing network. If error messages indicate that Backburner Manager cannot find Backburner Server or vice versa, see Connect the node to Backburner Manager (page 13).

Troubleshooting the background processing network

Problems with processing jobs may not be directly related to Burn but to the general setup or operation of the background processing network. You can use basic tools like ping to check that these areas are not causing a problem for Burn. The following general troubleshooting procedure can be used to verify that the background processing network is working properly. More detailed procedures are provided in the following sections.
Ensure basic network connectivity Using ping

The following information and procedure applies to all components of a background processing network. Burn works only when components on an Autodesk background processing network are communicating with each other. For example, if Backburner Manager cannot contact the render nodes over the network, jobs cannot be rendered remotely.

You can use ping to test connectivity between components on the background processing network.

- From the workstation, use ping to test communication between the Backburner Manager and each render node on the network.
- From the Backburner Manager workstation, use ping to test communication between the workstation and each render node on the network.
- From the render nodes on the network, use ping to test communication between the Backburner Manager and the workstations that submit jobs to the background processing network.
- If your network infrastructure supports jumbo packets, check that jumbo packets can be transferred between the workstation and the render nodes. See below.

Ensuring Network Connectivity for Jumbo Frames

Jumbo frames increase the efficiency of a background processing network, but must be supported throughout the network infrastructure. Burn problems can be caused by jumbo frames being sent to a switch or network adapter that is misconfigured or cannot handle these frames.

If you know that your network infrastructure supports jumbo frame switching, use the following procedure to test if jumbo frames can be sent between the workstations and render nodes. To test network connectivity using jumbo frames:

1. On a workstation or render node, open a terminal.
2. Run ping using the -s option to set the packet size used for network communications. Type: ping -s 50000 <hostname> where <hostname> is the hostname or IP address of the workstation or render node you are trying to reach.
3. If ping fails, ensure basic network connectivity between the same two network components: ping <hostname> where <hostname> is the hostname or IP address of the workstation or render node you are trying to reach. If step 3 works while step 2 failed, recheck the configuration for your network adapter and/or switch to ensure:
   - Jumbo frames are supported by both network components.
   - Both the network adapter and switch are properly configured for jumbo frame support.
   The network infrastructure in your facility may not support jumbo frame switching. Consult your network administrator if you are unsure if your network supports jumbo frames.

Checking Mount Points on the Background Processing Network

Certain directories on Visual Effects and Finishing workstations, such as /usr/discreet/clip and /usr/discreet/project, must be accessible as NFS mount points to render nodes, so that material for processing jobs can be retrieved by render nodes.

The directories shared by each Visual Effects and Finishing workstation must be mounted on the /hosts/<workstation_hostname> directory on render nodes, where <workstation_hostname> is the host name of the workstation submitting jobs to Burn. Normally, these directories are mounted automatically when you install the Visual Effects and Finishing application on the workstations, and the Burn software on the render nodes.
Perform the following procedure to check these mount points and ensure that render nodes can access material.

To check that mount points are accessible to the background processing network:

1. Log in as root to a render node, and open a terminal, if necessary. Type: cd /hosts/<hostname>/usr/discreet/clip where <hostname> is the name of the workstation submitting jobs to Burn.

2. If the previous step fails, configure the amd automounter service on each render node, and make sure the amd and NFS services are set to run automatically on each render node and workstation. See below.

3. Try again to connect to the usr/discreet/clip directory of the workstation that is submitting jobs to the background processing network, and create an empty file by typing: <workstation_hostname>/usr/discreet/clip/export_test where <workstation_hostname> is the hostname or IP address of the workstation. If the file cannot be created, permission to write to the required directories may not be assigned to the render nodes.

4. Check the permissions assigned to the file you created in the previous step. Type: ls -al /hosts/<workstation_hostname>/usr/discreet/clip where <workstation_hostname> is the hostname or IP address of the workstation. File system details for the export_test file you created appear.

5. Ensure that the owner of the file is root and the group ID is sys..

Configuring the amd Automounter on Render Nodes

The amd automounter is automatically installed on each render node by the custom Linux kickstart file. Perform the following tasks to modify the amd configuration file to redirect the mount point to /hosts instead of /net.: 

1. Log in as root to the render node. Stop the amd automounter daemon: /etc/init.d/amd stop

2. Open the /etc/amd.conf configuration file in a text editor and change /net to /hosts. So the file contains the following:

   #DEFINE AN AMD MOUNT POINT
   [ /hosts ]

3. Save and close the file then restart the amd daemon: /etc/init.d/amd start

Configure the NFS and amd services to start automatically

By default, the NFS and amd services are set to start automatically on workstations and render nodes. Perform the following procedure to check these services, and reconfigure their startup mode if necessary.

1. Log in as root to the workstation or render node. Open a terminal, and check that the amd and NFS services are running by typing: chkconfig --list | egrep ‘nfs|amd’ The output of the command should contain the following lines:

   nfs 0:off 1:off 2:on 3:on 4:on 5:on 6:off
   amd 0:off 1:off 2:on 3:on 4:on 5:on 6:off

2. If the services are not set to on for run levels 2 through 5, configure them to be started automatically with:

   chkconfig nfs on
   chkconfig amd on

3. Reboot the workstation or render node for the changes to take effect.
Enabling Export Permissions

Edit the /etc/exports file on the Visual Effects and Finishing workstation so that render nodes on the background processing network can access the media storage for the jobs submitted to Burn.

<table>
<thead>
<tr>
<th>Directory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/usr/discreet/clip</td>
<td>Enables remote access to clip libraries for Wire.</td>
</tr>
<tr>
<td>/usr/discreet/project</td>
<td>Enables remote access to projects by Burn at Burn start-up.</td>
</tr>
</tbody>
</table>

To edit the /etc/exports file:

1. As root, open for editing /etc/exports.
2. Enable access to the /usr/discreet directory on your workstation by appending to the file:
   
   /usr/discreet *(rw,sync,no_root_squash)

   This allows any remote system access to /usr/discreet. You can restrict access by adding the host names for each render node to the line, separated by a colon (:). For example, to restrict access to the /usr/discreet directory to nodes burn01 to burn03:
   
   /usr/discreet burn01:burn02:burn03(rw,sync,no_root_squash)

3. Save and close the file then apply the changes with:
   
   /usr/sbin/exportfs -va

Verify Stone and Wire connectivity from the background processing network

Render nodes on a background processing network access frames on storage devices attached to the workstation using the Wire network. To ensure these storage devices are available to the render node:

1. Log in as root to a render node on the background processing network. In a terminal, view all storage devices available to the render node: /usr/discreet/sw/tools/sw_framestore_dump. All storage devices attached to the Wire network appear.

2. If a storage device does not appear in the list of devices available to the render node, check:
   - The workstation is on the same network as the render node.
   - The workstation to which the device is attached is available on the network and can be pinged.
   - The probed daemon running on the workstation is using the same port as the rest of the network.
     See the entries for sw_probed and sw_probed.cfg in the Autodesk Visual Effects and Finishing Installation and Configuration Guide.
   - Verify that the sw_framestore_map file on the workstation contains only the local media storage: as root, open for editing /usr/discreet/sw/cfg/sw_framestore_map. Verify that only the local media storage appears in this file. If other media storage devices appear, delete them, unless server self-discovery is not enabled for Stone and Wire. Media storage devices must be explicitly listed in the sw_framestore_map file if server self-discovery is not enabled for Stone and Wire, such as when you are using legacy disk arrays. Use sw_framestore_dump to see if storage devices for other workstations on the network can be viewed. Save and close the file.

Checking Burn Licensing for Render Nodes

The following applies to all render nodes as well as the workstation or render node being used as the License Server for the background processing network. Render nodes must get Burn licenses from the License Server.
To process jobs. If the License Server is not working, or if Burn licenses cannot be checked out, jobs are not rendered. To ensure that licensing for Burn is working on the render nodes:

1. Log in as root to the render node or workstation running the License Server for the background processing network and check if the License Server is set to start automatically: `chkconfig --list | grep license_server`

2. If the License Server is not set to start running automatically, configure it to do so: `chkconfig license_server on`. If the License Server was not started, start it: `/etc/init.d/license_server start`

3. View the `/usr/discreet/licserv/log/boot.log` file for the License Server to ensure that the Burn license is being read by the server and check:
   - The versions of Burn that are licensed for the network
   - The start and expiry dates for Burn licenses
   - The workstation or render node running as the License server for the background processing network
   - The availability of each Burn license for render nodes

4. View the `/usr/discreet/licserv/licenses/DL_license.dat` file to see the number of Burn licenses purchased.

To check Burn licensing on a render node:

1. Log in as root to a render node that is not running the License Server.

2. Contact the render node or workstation running the License Server: `ping <hostname>` where `<hostname>` is the hostname or IP address of the render node or workstation running the License Server. If this step fails, check the network connection between the render node and the render node or workstation running the License Server, then retry `ping`. Otherwise, continue to the next step.

3. View the `/usr/local/flexlm/licenses/DL_license.dat` file to check that the render node is licensed for Burn. It should like something like the below. If it doesn't, contact customer support.

```
SERVER exuma-001
DLHOST01=886C2B75E8E57E4B03D784C3A2100AC0
DAEMON discreet_l discreet_l
USE_SERVER
```

4. Repeat the above for the remaining render nodes on the background processing network. If the License Server for your network is running on a render node, make sure you perform this procedure on this node as well. Otherwise, this node is able to distribute Burn licenses to other render nodes, but is unable to retrieve a license for itself.

Review log files

The following information and procedure applies to render nodes on a background processing network.

Review logged events in Burn and Backburner to identify the source of problems with the background processing network.

Since a background processing network may include many render nodes, a script called `GATHER_BURN_LOGS` is provided to collate and organize the log files from many render nodes into a single text file.

The script collects the Burn log files from `/usr/discreet/log`, and the Backburner logs from the `/usr/discreet/backburner/Network` directory of each Burn node.

To troubleshoot your background processing network:

1. If necessary, create a list of render nodes from which Burn and Backburner logs should be collected.
On your Autodesk Visual Effects and Finishing workstation, log in to the account for your Autodesk application and open a terminal. Run 

```
/usr/discreet/<product_home>/bin/GATHER_BURN_LOGS
```

where <product_home> is the directory where your application is installed. Run the script with -h for usage. This directory contains scripts and binary files for the application, including those used for submitting jobs to the background processing network.

The script collects Burn and Backburner logs from each render node listed in the script and collates these logs to a single text file. It uses the rsh protocol to access Burn render nodes. To avoid being prompted for login information while running this script, create a user account on the workstation and populate the .rhosts file on each render node with the hostname of the workstation followed by the username of this account. You can then use the -l option to run the script as this user.

---

**Test network components**

Reviewing Burn and Backburner log files can help to indicate the source of a problem on the background processing network. For example, log messages showing network timeouts for jobs may indicate a problem with the TCP/IP protocol or the Stone and Wire network.

Use the following scripts that are installed with Burn to test background processing network components and identify the source of the problem

- The verifySWConn script is used to test Wire network connectivity in the background processing network. Refer to Testing Stone and Wire Connectivity for Burn in this topic.
- The verifyBurnServer script is used to test whether a render node meets minimum hardware requirements for processing Burn jobs on a network. Refer to Testing Render Node Hardware for Burn in this topic.

**Testing Stone and Wire Connectivity for Burn**

The following information and procedure applies to workstations and render nodes on a background processing network.

Use the verifySWConn script to see if problems are due to Stone and Wire. This script can be run from a workstation or from a render node on the background processing network using the following procedure.

**To test Stone and Wire connectivity:**

1. Log in to the workstation or render node as follows:
   - For workstations, log in using the account for your application and open a terminal.
   - For Burn render nodes, log in as root and open a terminal, if necessary.
2. Navigate to the bin directory for your application by typing: 
   
   ```
   cd /usr/discreet/<product_directory>/bin
   ```
   
   where <product_directory> is one of the following:
   - For workstations, the directory where your application is installed.
   - For Burn render nodes, the directory containing the Burn version used on the background processing network.
   
   This directory contains Burn-related scripts, including the verifySWConn script.
3. Run the verifySWConn script:
   
   ```
   ./verifySWConn <options> <Workstation1 Workstation2 ...>
   ```
   
   where: <Workstation1 Workstation2 ...> are the workstations or Burn render nodes on which Stone and
Wire are to be tested. You must specify at least two workstations or render nodes to be tested. <options>
include the following options for this script.

<table>
<thead>
<tr>
<th>Option</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>-v</td>
<td>Enables additional verbosity.</td>
</tr>
<tr>
<td>-l&lt;username&gt;</td>
<td>Uses the specified user name to log in to the render node. If this option is omitted, you may be prompted to provide a username and password. The username must be valid on the test host.</td>
</tr>
</tbody>
</table>

The verifySWConn script runs, testing Stone and Wire functionality between each network component specified in the script.

### Testing Render Node Hardware for Burn

Use the verifyBurnServer script to see if a Linux system has the hardware requirements to be used as a Burn render node. The script also checks if a render node has a supported GPU-accelerated graphics card and graphics driver version, necessary for processing jobs that require a GPU.

To test render node hardware for Burn, log in to the render node as root and open a terminal. Run: 
/usr/discreet/<burn_version>/bin/verifyBurnServer

The verifyBurnServer script checks the hardware of the system to ensure it meets the requirements for Burn render nodes, and displays the results.

### Assess compatibility between jobs and render nodes

Read the following sections if you suspect problems with Burn may be due to memory issues on the render nodes, or that render nodes do not meet the graphics card requirements for a certain job type.

#### Processing jobs that require a GPU

Some of the jobs created in your Visual Effects and Finishing application (for example, floating point jobs, such as unclamped colors in Action, directional RGB blur, radial RGB blur) require a GPU-accelerated graphics card in order to be rendered. While your workstation is equipped with a GPU-accelerated graphics card, and can render such jobs locally, your background processing network is unable to render these types of jobs if no Burn node is equipped with a GPU.

To see if a render node has the hardware capabilities to process jobs that require a GPU, use the verifyBurnServer script, Backburner Monitor, or Backburner Web Monitor.

If you attempt to submit a job that requires a GPU to a background processing network where no render node is equipped with a GPU, one of the following situations occurs:

- If the BackburnerManagerGroupCapability keyword in the application’s init.cfg file is set up correctly, the application does not attempt to submit the job to the background processing network, and an error message is displayed. You must render the respective job locally on the Visual Effects and Finishing workstation.

- If the BackburnerManagerGroupCapability keyword is not set up properly, no error message is displayed and the application attempts to send the job to the background processing network. Since no render node can process the job, the job will be stuck in the queue indefinitely.

Use Backburner Monitor or the application’s Background I/O window to remove the job from the queue, and then set the BackburnerManagerGroupCapability keyword properly to reflect the hardware capabilities of your background processing network.
To avoid further problems, before attempting to submit a job that requires a GPU to your background processing network, make sure at least one of the render nodes is equipped with a GPU, and that the BackburnerManagerGroupCapability keyword in the application’s init.cfg file is set up correctly.

**Troubleshoot memory problems**

This section explains how to diagnose and address problems that are caused by jobs submitted from workstations with more memory than the render node.

Inferno 2013, Flame 2013, Flint 2013, Smoke 2013, and Backdraft Conform 2013 are all 64-bit applications, and can thus make full use of up to 16 GB of memory.

As a general rule, render nodes should have the same amount of RAM as the Visual Effects and Finishing workstation you are sending jobs from.

A Burn server running on a render node equipped with less memory than what is installed on your Visual Effects and Finishing workstation, may fail when processing these jobs due to their higher memory demands. However, do not assume that every problem on render nodes with less memory than your workstation is exclusively caused by memory issues.

If you suspect that a render node has failed due to a job exceeding the node’s memory capacity, check the logs:

1. If you are running graphics on the render node, log in as root and open a terminal. Otherwise, just log in as root.

2. Navigate to /usr/discreet/log. This directory contains logs of events for the Burn servers installed on the render node. You need to view the log created at the time the server failed. Identify the Burn log file from the time of the Burn server failure using one of the following methods:
   - If the render node has just failed, look for the following file:
     burn<version>_<render_node_name>_app.log.
   - If the render node failed previously and was brought back online, look for
     burn<version>_<render_node_name>_app.log.## created around the time of the render node's failure.

3. Review the messages in the log file for entries similar to the following which may indicate that the render node was experiencing memory problems at the time of failure.

   1. [error] 8192 PPLogger.C:145 01/24/06:17:06:16.998 Cannot load video media in node "clip17" for frame 2
   3. Increase your memory token.

4. Next, check the Backburner Server log file /usr/discreet/backburner/log/backburnerServer.log from the time of the server failure, using the methods listed above.

5. Review the messages in the Backburner Server log file in a text editor, looking for entries similar to the following:

   1. [notice] 16387 common_services.cpp:45 01/24/06:17:06:10.069 Launching 'burn'
   2. [error] 16387 common_services.cpp:37 01/24/06:17:06:48.182 Task error: burn application terminated (Hangup)
   3. [error] 16387 common_services.cpp:37 01/24/06:17:06:48.182 burn application terminated (Hangup)

These log entries confirm that a server failure occurred on the render node. Since you know the server failed around this time, you can deduce that the memory problem caused the Burn server to fail.

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Optional: Identify the workstation running the application that submitted the job, and then look at the Batch setup, timeline segment, or clip to try and determine why the Burn server failed. Knowing what factors caused the render node to fail may help you to gauge what jobs your render nodes can handle. It can also give you ideas about how to deal with this problem. Problems that cause the server to fail due to lack of memory on a render node, usually arise due to:

- The size of images used in a project. For example, projects using higher resolution HD, 2K, and 4K images require more memory to store and render than SD projects.
- The complexity of the effect sent for processing. For example, a complex Batch setup with many layers and effects requires more memory to render than a simple Batch setup.

### Addressing Memory Issues

If servers on your render nodes are failing while processing jobs, increase the amount of RAM set aside for processing jobs. You must repeat this procedure on each render node on your network running the server.

**To configure Burn to reserve a set amount of RAM for jobs:**

1. In a terminal, as root: `/etc/init.d/backburner_server stop`

2. In `/usr/discreet/burn_<version>/cfg/init.cfg` uncomment the `MemoryApplication` keyword. This keyword sets the amount of RAM in megabytes (MB) to be reserved for Burn jobs. This keyword is disabled by default so Burn can dynamically adjust the amount of RAM used for each job based on the resolution of the project. When you enable this keyword, Burn reserves the same amount of memory for each job regardless of the project’s resolution.

3. If necessary, change the value for the `MemoryApplication` keyword to set the amount of RAM (in MB) to be reserved for each Burn job up to 1400 (about 1.4 GB). For example: `MemoryApplication 1024`. Setting the `MemoryApplication` keyword so that the (total render node memory) - (value of `MemoryApplication`) is less than 2600 MB may adversely affect the stability of the render node.

4. Save and close `init.cfg` and restart the Backburner Server on the render node by typing: `/etc/init.d/backburner_server start`

5. Optionally implement the following guidelines for processing Burn jobs. Although these guidelines are not mandatory, following them may help increase the success rate while processing Burn jobs on render nodes with limited memory resources.

   - If you know that the size of images in your projects may cause render node failure, enforce guidelines about what can and cannot be sent to the Burn render nodes. For example, if you know that 2K and 4K images with Batch setups exceeding six layers may cause the render nodes to fail, ensure these setups are not sent to Burn.

   - If you know that the complexity of the effects sent for processing may cause render node failure, simplify effects by creating multiple Batch setups or by processing memory-intensive effects locally. For example, if you know that complex Batch setups with multiple logic ops and colour correction may cause render nodes to fail, render these locally instead.

If, after following these guidelines, your render nodes still fail because of low memory, consider adding memory to the render nodes. Matching the amount of memory on the render nodes with the amount of memory found on your Visual Effects and Finishing workstation is the most effective solution to memory issues.
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