BANDWIDTH MANAGEMENT USING UNIPRINT

TECHNICAL WHITE PAPER

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Introduction

UniPrint provides features that allow administrators to further enhance bandwidth management in their Server-based Computing (SbC) environment. Part of maintaining an efficient SbC environment includes:

- Ensuring optimal use of the bandwidth available.
- Ensuring that a single user is not consuming all bandwidth.
- Ensuring that a large print job does not slow down the rest of the network.

UniPrint utilizes the PDF (Portable Document Format), which is a highly efficient, and compressed format for documents that ensures the size of print jobs being sent in an SbC environment are optimal. There are several other ways to accomplish this in an SbC environment using UniPrint:

- UniPrint Bandwidth Throttling options.
- Virtual Channel Priority settings.
- Citrix Bandwidth Throttling features.

UniPrint Bandwidth Throttling Options

Bandwidth Throttling options can be implemented using features available to specify packet size and bandwidth upon client connection. These settings can be defined upon install, on an individual client using the **Bandwidth Throttling** tab in the **Settings** dialog box, or through Active Directory using Group Policy and the UniPrint Client ADM.

The key settings available are:

- **Packet Size**: This can be modified to optimize network throughput based on packet size and the amount of data transmitted in a single stream. Over networks with a lower Maximum Transmission Unit (MTU), packet size can be reduced to achieve more efficient use of bandwidth by preventing packet fragmentation. The optimal setting for an Ethernet network would be in the range of 1380 to 1400 bytes.
- **Packet Latency**: This setting ensures that printing traffic does not saturate the network. This setting causes UniPrint to wait X number of milliseconds between each packet sent. For optimal speed this setting should be set to 0.

Caution: Setting Bandwidth Throttling options such that the maximum packet size is 600 bytes and the delay between packets is 1000 milliseconds will cause severe printing delays.

Virtual Channel Priority Settings in Citrix

Each virtual channel is assigned one of four priority settings:

- 0 - High Priority (reserved for ThinWire virtual channels)
- 1 - Medium Priority
- 2 - Low Priority
- 3 - Background Priority.

The default priority settings for UniPrint is 3. This ranks UniPrint traffic below client audio mapping and client drive mapping. This setting is part of the ICA framing header and can be modified in the registry. The recommended settings for UniPrint range between 3 and 1.

To change this setting you will need to follow the document: http://support.citrix.com/servlet/KbServlet/download/23-102-7625/ICA_Priority_Packet_Tagging.pdf.

When modifying the registry use the Virtual Channel Name: `CTXUNPR`

Thus a sample entry would look similar to:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Ter-
minal Server\Wds\icawd] "Priority"=...CTXCPM,3 OEMOEM,3
OEMOEM2,3 CTXUNPR,N
```

Quality of Service (QoS) devices should not be required to implement this solution but can provide improved bandwidth control if implemented properly.

Citrix Bandwidth Throttling

Citrix Bandwidth Throttling features allow administrators to control the maximum amount of overall bandwidth in a given session. This ensures that one session does not consume a disproportionate amount of bandwidth. UniPrint does not use the standard printing virtual channel, therefore session bandwidth throttling should be used in a Citrix environment. Citrix Bandwidth Throttling is only available in Citrix Presentation Server 3 or later.

Summary

There are several options that administrators have for making efficient use of the bandwidth available in their SbC environments. The most appropriate option(s) will vary depending on the environment and desired outcome.