Executive Summary:

- Customer experiencing persistent XenApp and XenDesktop performance issues with printing and logon process
- Root cause of performance issues could not be determined
- Goliath retained to perform troubleshooting assessment
- Root cause of printing and logon issues identified
- Fix actions recommended and implemented
- Support tickets decreased by 25% in 30 Days
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I. Overview

Client requests an investigation into the root cause of persistent performance issues. Goliath Technologies was retained to interrogate the XenApp and XenDesktop farm and role servers along with the supporting infrastructure. Data was gathered over a two week period with the following observations and reports by Goliath. The Proactive initiatives and resolutions suggested by Goliath are also included.

Results Highlight:

- Pinpointed root cause of printing and profile issues with resolution steps
  - Printing:
    - Unknown Drivers from Unknown Printers
    - Citrix Print Driver Failures
    - Incorrect Printer Port Mappings
    - Citrix Print Manager Service Crashes
  - Profile:
    - Group Policy & Registry Problems
    - Folder Redirection
    - Windows User Profile Service Errors
- Identified 6 additional high risk failure points
  - Gold Image Problems
  - Citrix XenApp Server Errors
  - SSL Communication Issues
  - Application Failures
  - Application Load Balancing Problems
  - Remote User Performance
- Deployed monitors to all elements of the XenApp and XenDesktop delivery infrastructure including:
  - All role servers: StoreFront (XenDesktop), Web Interface (XenApp), License Server, XenApp ZDCs, XenDesktop DDCs, XenApp Session Hosts, Gold Image
  - Supporting Servers: Active Directory, SQL Servers, File/Profile Servers, Application Servers
  - Infrastructure: VMware Hypervisor, Storage, and Firewalls for WAN performance
- Set alert sequences based on events, thresholds, and faults
  - During assessment, Goliath allowed administrators to avoid XenDesktop farm downtime:
    - Alerted on High Memory usage by the DDC and identified that all VDI sessions were going through one broker.
    - After alert, Administrators applied Citrix hotfix and, as a result, were able to confirm that sessions were again being balanced effectively across DDCs
- Scheduled reports to run daily, weekly, and monthly
- Iterated Help Desk actions in alert resolution feature
II. Deployment Description

Goliath Technologies was deployed to the following infrastructure elements:

Connections to:
- 2 VMware vCenter Servers and 250 Hosts
- 2 XenApp Farms: XenApp 6.5 and 4.5
- 1 XenDesktop Farm: 7.1
- 2 Data Centers

Elements Monitored:
- 75 VMware Hosts
- 2500 VMs
- 175+ XenApp Servers
- 2000 VDI Sessions
- 3500 XenApp/XenDesktop sessions
- 1165 Agents Deployed
- Gold Image Updated with Agent
- 200 Workstations
- 783 Datastores
- 100 physical servers
- 6 NetScalers

III. Configuration: 1 Day

After installation, out-of-the-box rules and dashboards were automatically applied to the inventory. Immediately afterward, a follow-on configuration effort was initiated to deploy agents and build custom rules and reports to identify printing and profile issues.

Monitoring Rules:

The following monitoring rules were added over the course of the first day:
- 50 Out-of-the-Box Monitoring Rules
- 20 XenApp Out-of-the-Box Monitoring Rules
- 25 XenDesktop Out-of-the-Box Monitoring Rules
- 60 Custom Monitoring Rules based on problems found in the environment with the Out-of-the-Box Rules. The following rules were built to identify conditions before a problem occurs or alert the moment a failure happens, as appropriate.
  - 8 for Printing Issues
  - 10 for Profile Errors
  - 15 for Application Errors
  - 10 for Citrix Session and XenApp Server Faults
  - 6 for Group Policy Issues
  - 10 for Server Communication Problems

Reports:

15 Reports were scheduled to run weekly to identify:
- Printing Health Report
- User Profile & Profile Management Errors
- Gold Image Health Report
- Citrix Session Host Errors
- XenApp Server Health Reports
- Logon Duration
- Licensing
- Application Failures
- Citrix XenApp & XenDesktop Peak Usage Reports
- SSL & Communication Errors
- Application Session/Usage Report
- Load Balanced Application Performance Report
- User Investigation Report
- Application Resource Usage Report
- Citrix ICA Latency Report
Dashboards:

6 Out-of-the-Box Dashboards configured:
- VMware Dashboards
- XenApp Dashboards
- XenDesktop Dashboard
- Logon Simulator
- Network Usage Dashboard
- Environment Heat Map by Citrix Farm and Desktop Group

IV. Observations
Over the course of deployment and configuration, environmental events and issues are picked up by Goliath Technologies. Goliath was able to immediately determine the nature of the printing and profiles problems that had affected the Citrix environment and other conditions taking place as well. These are defined below:

A. Printing Issues

Printer driver issues were manifesting in four ways in the environment: Unknown drivers from unknown printers, bad printer drivers, incorrect printer port mappings, and Citrix Print Manager Service crashes. Reports and alerts were created to identify when these failures happen and, if possible, prevent them from impacting end users.

1. Unknown Drivers from Unknown Printers:
Unknown drivers are generally the result of users attempting to print to home or personal printers which are not part of the supported driver set for the Citrix Universal Print Driver. A print failure report includes a number of these cases and rules were created to identify when these events happen.

Suggestions:
- a) Create policy that indicates if user signs in from home/outside network that local printers don’t get mapped.
- b) Check to see how Citrix UPD is being replicated

Questions:
- a) If mapping from home PCs, is that a HIPPA compliance issue?
- b) Is it necessary to enable users to print from home?
- c) If it is deemed unnecessary to print from home, would it be possible to implement a policy to not allow mapped printers from home?

2. Citrix Print Driver Failures:
Driver corruption or failures can often occur after the Citrix Print Manager service gets stuck or a print job causes the print spooler process to crash. A series of rules were created to identify these conditions.

Suggestions:
- a) Identify the issue and send to Service Desk with the instruction to kill the process and restart the printer service. Let the Users know that they should resubmit the print job. If approved, Goliath will kill the process and restart the service; Service Desk will notify users to resubmit print jobs
- b) Run stressprint.exe from Citrix to test the drivers to ensure compatibility
3. **Incorrect Printer Port Mappings:**

Printer auto-creation failures in this environment were frequently a derivative of the first two items above, but sometimes they were the result of printers not able to map the port correctly. An alert was created to identify these occurrences.

**Suggestions:** Give instructions to Service Desk on how to go fix the problem and map the printers manually. Include these instructions in the *Alert Resolution Feature*.

4. **Citrix Print Manager Service Crashes:**

A monitoring rule was put in place to alert if the Citrix Print Manager self-recovery does not take place or does not succeed. In this environment, the print manager service’s restart would often not succeed, so a corresponding rule was created to identify if the CpSvc.exe process was stuck as well.

**Suggestions:**

a) To triage the event, identify the issue, and send information to Service Desk with the instruction to kill the process and restart the printer service. Let the Users know that they should resubmit the print job. If approved MonitorIT will kill the process and restart the service; Service Desk will notify users.

b) Run CDFTrace to see what is causing the service to crash, and analyze the output to understand if it was a driver issue, print job, etc. at the core of the problem.

**Monitoring Rules and Auditing the Resolution:**

Monitoring Rules were created to immediately identify the issues that were occurring, so that the Help Desk can be notified and advised as to the best way to triage the condition. These events can also be tracked in the reports to understand the week-over-week persistence of these events and their effect on the ultimate resolution.

**Long Term Resolution for Printing Issues:**

If printing is core to the business and needs to be done from multiple locations then a combination of a third party print management tool and Citrix UPD would normally be the best way to deliver an effective printing solution. In order to determine this, it is important to understand the frequency of printing and if proximity printing is allowed or needed, the client device landscape, and ultimately what needs to be done with printing. A solution would need to be put in place and the administrators should be furnished with a process for introducing new print drivers to ensure ongoing stability.

**B. Profile Problems**

Profile problems appear to stem from underlying registry and security issues that result in the following problems:

1. **Group Policy & Registry Problems:**

Group Policy problems along with registry corruption seem to be the root cause or related to most profile problems. These events can start when a policy fails to apply or there is insufficient security to apply a group policy. Alerts and a report were created to identify and track these conditions.
Suggestions: To start with run DSDiag and analyze the output to understand where the problems could be coming from. An understanding of the topology followed by a review of the registry and group policy would be necessary in order to fix the core issue here.

2. Folder Redirection:
Folder redirection issues manifest with the Citrix Profile Manager, Windows User Profile Services, and Terminal Server User Home Directory. Files or Folders cannot be found, profiles fail to load, or users are put into temporary profiles. Alerts were built to identify if any of these three conditions occur.

Suggestions: Folder Redirection needs to be reviewed to first understand what is being redirected with a close look at what is being excluded or more importantly, not excluded. Citrix Profile Manager allows for a lot of configuration and may be able to be adjusted and configured properly to resolve these problems. In some cases, the best way to address this is with third party tools.

3. Windows User Profile Service Errors:
These issues are not to be confused with Citrix Profile Manager problems, which while present in the environment, are few and far between. These issues generally start when there are insufficient security rights present to load the profile or a registry problem has prevented group policy from being applied. A local profile generally then tries to be loaded and where group policy problems persist. Alerts were built to identify these events.

Suggestions: Resolving the Group Policy and Registry issues along with a properly configured Profile Management solution should mitigate these errors.

Monitoring Rules and Auditing the Resolution:
Monitoring Rules were created to immediately identify the issues that were occurring, so that the Help Desk can be notified and advised as to the best way to triage the condition. These events can also be tracked in the reports to understand the week-over-week persistence of these events and their effect on the ultimate resolution.

Long Term Resolution for Profile Issues:
A close review and diagnosis of the Active Directory in the environment needs to be done in order to fix the Group Policy and Registry problems that are taking place. Ultimately, a review of the Citrix Profile Management configuration should be done to understand the folder redirection issues.

C. Other Findings

Over the course of reviewing the environment, we found a number of reoccurring issues in the environment, including Citrix XenApp Server failures, SSL Communication Issues, problems propagated by configuration in the Gold Image, and a proliferation of application failures. Alerts and Reports were created.

1. Gold Image Problems:
Gold Image problems were identified by issues that were taking place persistently, 24 hours a day, seven days a week. There were three issues:
- DCOM remote activation request failures for users logging on
- Update Manager Service trying to execute from a mapped drive
• McKesson Media Library update tries to take place and fails due to a newer version being present. This was a known issue for McKesson, but did not have a resolution. A report has been configured to track these events.

2. **Citrix XenApp Server Errors:**
   Occurrences were found where the RDP protocol detected an error or the security layer of terminal services on the Citrix XenApp servers detected a problem with the protocol stream and disconnected users. Alerts were created so administrator were notified when this happened.

3. **SSL Communication Issues:**
   This was one of the most common errors seen across the environment and occurred as one of four types of errors, all of which resulted in connection refusals. Alerts were set up to identify when this happened and a report was created to run automatically and identify how many occurrences had taken place. They are:
   - The server hostname listed in the certificate is not correct and does not match the server’s actual hostname
   - Certificate Authority could not be located or could not be matched to a known, trusted CA
   - SSL 3.0 connections failed because the cipher suites on server and client did not match
   - SSL connections were refused due to an untrusted certificate

4. **Application Failures:**
   There were a number of application failures, which were identified and tracked so that they can be readily identified before a user calls. A few stand out issues include:
   - **Microsoft Outlook Crashes:** In addition to failures and crashes, at times Outlook would load in safe mode, and even then would fail to load into safe mode. These are usually the result of plugin/add-on problems. Alerts were set up to identify when this occurred as the users would most likely be unable to access email.
   - **Line of Business Application Errors:** The LoB App Launcher, LoB App Document Management, and Bootstrap process failures were all identified with alerts configured to notify when future occurrences took place.
   - **General Application Hangs & Crashes:** These were identified with alerts created to catch when these events happen.

5. **Application Load Balancing Problems**
   - Goliath was able to identify a number of applications that were attempting to be opened by unsupported browsers, resulting in user errors.
   - Some of the application pages were not loading and users were getting errors when accessing some of the application sections. These errors were only happening on certain servers which Goliath was able to identify.

6. **Remote User Performance**
   In general, users launching published application and desktop sessions from outside the network were seeing high ICA Latency and client-side round trip times. These issues were not related to internal infrastructure or corporate network problems, but rather users with poor internet connections attempting to access resources. Goliath configured alerts for when these events happen so the Help Desk knows it is not a problem on the corporate side, but rather the end user's responsibility.
V. Proactive Initiatives

A. Monitoring Rules
The following rules were created to identify all problem events:

<table>
<thead>
<tr>
<th>Error Category</th>
<th>Error Source</th>
<th>Proactive Action</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>App - General</td>
<td>Application Hang</td>
<td>Report</td>
<td>All application failures; catch all</td>
</tr>
<tr>
<td>App - General</td>
<td>Application Hang</td>
<td>Report</td>
<td>Program Stopped interacting with windows and closed</td>
</tr>
<tr>
<td>App - LoB</td>
<td>MsiInstaller</td>
<td>Report</td>
<td>Line of Business App Update Failure</td>
</tr>
<tr>
<td>App - LoB</td>
<td>Application Error</td>
<td>Alert</td>
<td>Line of Business App BootStrap Failure</td>
</tr>
<tr>
<td>App - LoB</td>
<td>Application Error</td>
<td>Alert</td>
<td>Line of Business application failures; catch all</td>
</tr>
<tr>
<td>App - LoB</td>
<td>Application Error</td>
<td>Alert</td>
<td>Line of Business app Document Management Error</td>
</tr>
<tr>
<td>App - MS Communicator</td>
<td>Application Error</td>
<td>Report</td>
<td>Rule created to capture events/failures for reporting</td>
</tr>
<tr>
<td>App - MS Communicator</td>
<td>LiveMeeting</td>
<td></td>
<td>LiveMeeting unable to resolve DNS hostname of the login server</td>
</tr>
<tr>
<td>App - MS Excel</td>
<td>Application Error</td>
<td>Alert</td>
<td>Microsoft Excel hung or crashed</td>
</tr>
<tr>
<td>App - MS IE</td>
<td>Application Error</td>
<td>Alert</td>
<td>Microsoft Internet Explorer hung or crashed</td>
</tr>
<tr>
<td>App - MS Media Player</td>
<td>Application Error</td>
<td>Alert</td>
<td>MS Media Player hung or crashed</td>
</tr>
<tr>
<td>App - MS Outlook</td>
<td>Application Error</td>
<td>Alert</td>
<td>Microsoft Outlook hung or crashed</td>
</tr>
<tr>
<td>App - MS Outlook</td>
<td>Microsoft Office 14</td>
<td>Alert</td>
<td>Outlook in Safe Mode</td>
</tr>
<tr>
<td>App - MS Outlook</td>
<td>Microsoft Office 14</td>
<td>Alert</td>
<td>Outlook launch in Safe Mode rejected</td>
</tr>
<tr>
<td>Citrix - Citrix ICA</td>
<td>Application Error</td>
<td>Alert</td>
<td>can cause session close/crash</td>
</tr>
<tr>
<td>Citrix - Citrix ICA</td>
<td>Citrix.Xip.ClientService</td>
<td>Alert</td>
<td>no update server found; client service stopped</td>
</tr>
<tr>
<td>Citrix - Terminal Services</td>
<td>TermDD</td>
<td>Alert</td>
<td>RDP protocol detected an error in the protocol stream and disconnected</td>
</tr>
<tr>
<td>Group Policy</td>
<td>Group Policy Registry</td>
<td>Alert</td>
<td>Could not apply user policy settings</td>
</tr>
<tr>
<td>Group Policy</td>
<td>Group Policy Registry</td>
<td>Alert</td>
<td>client-side extension caught the unhandled exception 'execution of package to apply policy' inside</td>
</tr>
<tr>
<td>Group Policy</td>
<td>Microsoft-Windows-GroupPolicy</td>
<td>Alert</td>
<td>Group Policy Processing Failed</td>
</tr>
<tr>
<td>Group Policy</td>
<td>Group Policy Folder Option</td>
<td>Alert</td>
<td>client-side extension caught the unhandled exception</td>
</tr>
<tr>
<td>Group Policy</td>
<td>Group Policy Folders</td>
<td>Alert</td>
<td>could not apply policy due to access violation; memory could not be read</td>
</tr>
<tr>
<td>Group Policy</td>
<td>Microsoft-Windows-GroupPolicy</td>
<td>Alert</td>
<td>Could not apply the registry-based policy settings for the Group Policy object.</td>
</tr>
<tr>
<td>Printing</td>
<td>MetaFrameEvents</td>
<td>Alert</td>
<td>Printer Auto-Creation Failure</td>
</tr>
<tr>
<td>Printing</td>
<td>Application Error</td>
<td>Alert</td>
<td>Citrix Print Manager Service</td>
</tr>
<tr>
<td>Printing</td>
<td>MetaFrameEvents</td>
<td>Alert</td>
<td>Driver not installed</td>
</tr>
<tr>
<td>Printing</td>
<td>MetaFrameEvents</td>
<td>Report</td>
<td>Printer Auto-Creation Failure</td>
</tr>
<tr>
<td>Error Category</td>
<td>Error Source</td>
<td>Proactive Action</td>
<td>Notes</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Printing</td>
<td>UmrdpService</td>
<td>Report</td>
<td>Driver required for Printer Unknown</td>
</tr>
<tr>
<td>Printing</td>
<td>UmrdpService</td>
<td>Alert</td>
<td>Citrix UPD Driver failed to load Printer</td>
</tr>
<tr>
<td>Printing</td>
<td>Service Control Manager</td>
<td>Report</td>
<td>CPM Failures</td>
</tr>
<tr>
<td>Printing</td>
<td>Service Control Manager</td>
<td>Alert</td>
<td>CPM Failed to Restart</td>
</tr>
<tr>
<td>Profile</td>
<td>Microsoft-Windows-Folder-Redirection</td>
<td>Report</td>
<td>Failed to apply policy and redirect folder; cannot find the file</td>
</tr>
<tr>
<td>Profile</td>
<td>Microsoft-Windows-User Profiles Service</td>
<td>Report</td>
<td>Cannot load classes registry file</td>
</tr>
<tr>
<td>Profile</td>
<td>Microsoft-Windows-User Profiles Service</td>
<td>Report</td>
<td>registry load failure - insufficient memory or security rights; not in a registry file format</td>
</tr>
<tr>
<td>Profile</td>
<td>Microsoft-Windows-User Profiles Service</td>
<td>Report</td>
<td>cannot load the local profile - insufficient security rights or a corrupt local profile</td>
</tr>
<tr>
<td>Profile</td>
<td>Microsoft-Windows-User Profiles Service</td>
<td>Report</td>
<td>profile backed up</td>
</tr>
<tr>
<td>Profile</td>
<td>Microsoft-Windows-User Profiles Service</td>
<td>Report</td>
<td>logging user on with a temporary profile</td>
</tr>
<tr>
<td>Profile</td>
<td>Citrix Profile Management</td>
<td>Alert</td>
<td>The user store cannot be reached</td>
</tr>
<tr>
<td>Profile</td>
<td>Citrix Profile Management</td>
<td>Alert</td>
<td>Terminal Services User Home Directory was not set because the path specified does not exist or not accessible. Default Home Directory Path Used Instead</td>
</tr>
<tr>
<td>Profile</td>
<td>TermService</td>
<td>Alert</td>
<td>Registry hive corrupted and recovered</td>
</tr>
<tr>
<td>Registry</td>
<td>Microsoft-Windows-Kernel-General</td>
<td>Report</td>
<td>HTTP Error - Connection failed or refused by Server</td>
</tr>
<tr>
<td>Server - General</td>
<td>MSSSOAP</td>
<td>Alert</td>
<td>Application not allowing Remote Activation</td>
</tr>
<tr>
<td>Server - General</td>
<td>DCOM</td>
<td>Report</td>
<td>Server failed to register with DCOM</td>
</tr>
<tr>
<td>Server - General</td>
<td>Kerberos</td>
<td>alert</td>
<td>Target service is using a different password for the target service account than what the KDC has for the target service account</td>
</tr>
<tr>
<td>Server - General</td>
<td>volmgr</td>
<td>alert</td>
<td>crash dump initialization failed</td>
</tr>
<tr>
<td>Server - SSL</td>
<td>Schannel</td>
<td>Alert</td>
<td>SSL 3.0 Connection failed; none of the cipher suites supported by the client are supported by the server.</td>
</tr>
<tr>
<td>Server - SSL</td>
<td>Schannel</td>
<td>Report</td>
<td>SSL Connection Request Refused due to Untrusted Certificate</td>
</tr>
<tr>
<td>Server - SSL</td>
<td>Schannel</td>
<td>Alert</td>
<td>SSL Connection Request Failed; Certificate does not contain correct Server Name</td>
</tr>
<tr>
<td>Server - SSL</td>
<td>Schannel</td>
<td>Alert</td>
<td>Certificate was not accepted because the CA certificate could not be located or could not be matched with a known, trusted CA. This message is always fatal.</td>
</tr>
<tr>
<td>Server - Windows Explorer</td>
<td>Application Error</td>
<td>Alert</td>
<td>Windows Explorer hung or crashed</td>
</tr>
</tbody>
</table>
### B. Reports
The following reports were created and scheduled to track events in the infrastructure:

<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printing Health Report</td>
<td>Printer driver, Citrix Universal Print Driver, and printer auto-creation errors and failure</td>
</tr>
<tr>
<td>User Profile &amp; Profile Management Errors</td>
<td>Errors related profile problems</td>
</tr>
<tr>
<td>Gold Image Health Report</td>
<td>Identifies problems that occur persistently on ALL servers</td>
</tr>
<tr>
<td>Citrix Session Host Errors</td>
<td>Terminal Services, ICA failures, and events preventing session launch</td>
</tr>
<tr>
<td>XenApp Server Health Reports</td>
<td>Report on key metrics for failure: Server load, users, disk, CPU, RAM</td>
</tr>
<tr>
<td>Logon Duration</td>
<td>Breaks down the logon process and how long it took a user to sign in</td>
</tr>
<tr>
<td>Citrix Licensing</td>
<td>Tracking Citrix licensing usage for XenApp and XenDesktop</td>
</tr>
<tr>
<td>Application Failures</td>
<td>Application crashes and hangs</td>
</tr>
<tr>
<td>Citrix XenApp &amp; XenDesktop Peak Usage Reports</td>
<td>Trends concurrent users to identify peak usage times</td>
</tr>
<tr>
<td>SSL &amp; Communication Errors</td>
<td>SSL failures, DCOM events, SOAP failures and connection terminations</td>
</tr>
<tr>
<td>Application Session/Usage Report</td>
<td>Identify the number of Application Launches and by whom</td>
</tr>
<tr>
<td>Load Balanced Application Performance Report</td>
<td>Application connections, latency, errors, max response times</td>
</tr>
<tr>
<td>User Investigation Report</td>
<td>Identifies all the events and problems that took place for a user</td>
</tr>
<tr>
<td>Application Resource Usage Report</td>
<td>Track Application resource utilization across environment</td>
</tr>
<tr>
<td>Citrix ICA Latency Report</td>
<td>Identify users experiencing highest latency by a threshold</td>
</tr>
</tbody>
</table>
C. Remediation Actions and Alert Resolution Feature

Rules were created to identify the problems listed above, and in appropriate cases, populated with suggested fix and troubleshooting actions, as depicted below. This is valuable as an audit trail for consistent response behavior and instructional for Service Desk. Furthermore remediation actions can and should continue to be built by your consultants and your engineers. As the monitoring technology identifies issues and clarifies the source of problems, remediation actions can often be built to mitigate or fix problems. Furthermore, as the environment evolves, new problems or issues will appear, where the resolution can be automated or documented for Service Desk and admins to address the conditions:

![Specify Monitoring Rule Parameters and Properties](image)

Issue and Remediation Actions Documented in Alert Resolution Feature for Service Desk:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Proactive Action with MonitorIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application using a full CPU core for a sustained period of time</td>
<td>Alert admin and notify user/restart app</td>
</tr>
<tr>
<td>Sustained XenApp Server CPU Utilization over 90% (threshold custom set)</td>
<td>Alert admin/reboot server/notify users of system restart</td>
</tr>
<tr>
<td>XenApp Server is misconfigured or is having configuration issues and is reporting with a Server Load of 20000.</td>
<td>Perform common resolution steps – restarting WMI service, turning off logins, and alerting admins.</td>
</tr>
<tr>
<td>XenApp Servers are close to capacity</td>
<td>Alert admin/disable logins</td>
</tr>
<tr>
<td>XenDesktop VMs are reporting unregistered</td>
<td>Alert admin and restart VM so the VDA agent can register back with the broker</td>
</tr>
<tr>
<td>WAN bandwidth is a sustained 85% Utilization or higher</td>
<td>Notify admin before external users start seeing performance impact</td>
</tr>
<tr>
<td>Drive space availability falls below 1 GB</td>
<td>Clear all temp files and notify admin if space not recovered-admin can take more aggressive action to prevent profile and session issues</td>
</tr>
<tr>
<td>VDI Session or XenApp Server experiencing high CPU Ready (VM waiting on available CPU cycles)</td>
<td>Alert admin and migrate VM to another host with more CPU resources available</td>
</tr>
</tbody>
</table>
## VI. Report Samples

**XenApp Session Report**

### HOW TO USE:
Run this report on a daily or weekly basis, or as required by management to show utilization of the farm.

### PURPOSE:
Identify Users that have persistently high ICA Latency conditions and track Session growth. This report can be filtered to track a user’s behavior and session performance, or a particular Application’s utilization over a given period of time.

### Farm Name | JX Server Name | Session Name | User Account | Date | Client Name | Version | Client Address | App Name | Connect EST | Disconnect EST
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Support | SVR-SS01 | 60c69e25 | Admin | 2.10.20.195 | 19.20.30.151 | 19.20.30.151 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11
Support | SVR-SS02 | 60c69e25 | Admin | 2.10.20.195 | 19.20.30.151 | 19.20.30.151 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11
Support | SVR-SS03 | 60c69e25 | Admin | 2.10.20.195 | 19.20.30.151 | 19.20.30.151 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11
Support | SVR-SS04 | 60c69e25 | Admin | 2.10.20.195 | 19.20.30.151 | 19.20.30.151 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11 | 123.12.10.11

### HOW TO USE:
Review this information weekly and monthly to understand utilization trends.

### PURPOSE:
Identify CPU resource deficiencies in the farm, unbalanced servers, and identify future needs for CPU resources as utilization grows. Long transaction times and user slowness can be mitigated by identifying times where there is a persistently high CPU queue length. This information can then be leveraged to better balance workloads at those times.

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HOW TO USE: Look at this dashboard in real-time, or change the charts to trend weekly or monthly utilization for reporting.

PURPOSE: Quickly understand the effect of resource availability on session performance, or correlate session growth to resource utilization needs. Quickly identify sessions experiencing high ICA latency or servers with a high server load that will affect performance.

HOW TO USE: Review this information weekly and monthly to understand utilization trends.

PURPOSE: Juxtapose Server Load against CPU and Memory utilization over the same period of time. Identify Server Load growth over time to identify the growth in user adoption of XenApp and system resource availability to sustain the utilization. Quickly identify bottlenecks at certain times of day which can be used to better balance workloads, and servers with abnormal resource utilization.
HOW TO USE: This report should be scheduled to be emailed right to your inbox at least four times a day – first thing in the morning, mid morning, afternoon, and end of day.

PURPOSE: Busy administrators need information at their fingertips, so by receiving these reports right in their inbox, they can quickly ascertain problem conditions – unregistered VDI Sessions or a low count of VDI VMs in a pool. This report can also help identify VDI Sessions that have been up for longer than normal, especially after a new image was pushed live, and it can often be indicative of a stuck session or improperly configured VM.

HOW TO USE: Run this report on a daily or weekly basis, or as required by management to show utilization.

PURPOSE: Track Session growth, problematic VDI Sessions, and VDI sessions that have been locked for long periods of time.
DESCRIPTION: Event logs are a powerful source of information that can be leveraged to identify the causes of crashes, failures, or configuration issues during deployment. In a VDI environment, logs become ever more important, especially with PVS, because they can be used to identify the source of crashes and logon problems as the situation is unfolding. Because they get sent to MonitorIT in real-time, the loss of logs from reboots are no longer an issue.