Printing in Samba 4.x

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Printing

1. Current state
   - New features of Samba 4.0

2. The new printing protocol
   - Print System Asynchronous Remote Protocol (MS-PAR)
   - Supporting MS-PAR in Samba
Reporting bugs

http://www.samba.org/~asn/reporting_samba_bugs.txt
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We fixed the most important option

- disable spoolss = true
What we have in 3.6 too

- Rewritten that the lanman/printing (RAP) code goes through spoolss
- spoolss uses the RPC winreg protocol to store all data now
- If you update from 3.5 to 3.6 or 4.x we automatically convert the printing tdb
- `net printing migrate encoding=CP1252 ntprinters.tdb`
- Improved Linux Printing Queue Daemon (lpqd)
- A lot of new spoolss tests
Linux Printing Queue Daemon (lpqd)

Background task talking to the Linux printing system.

- The only process updating the printcap cache
- Notifies all other daemons about cache update when done
- Checks if there is a task pending every 60 second
- `printcap cache time = 1` will only run every 60 seconds
### The spoolss daemon (spoolssd)

`ps afx -o pid,wchan=WIDE-WCHAN-COLUMN -o comm`

<table>
<thead>
<tr>
<th>PID</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>17030</td>
<td>smbd</td>
</tr>
<tr>
<td>17032</td>
<td>_ spoolssd-master</td>
</tr>
<tr>
<td>17033</td>
<td>_ lpqd</td>
</tr>
<tr>
<td>17034</td>
<td>_ spoolssd-child</td>
</tr>
<tr>
<td>17035</td>
<td>_ spoolssd-child</td>
</tr>
<tr>
<td>17037</td>
<td>_ spoolssd-child</td>
</tr>
<tr>
<td>17038</td>
<td>_ spoolssd-child</td>
</tr>
<tr>
<td>17039</td>
<td>_ spoolssd-child</td>
</tr>
</tbody>
</table>
The spoolss daemon (spoolssd)

- **master** simple daemon with small memory footprint
- **master** only forks and kills child serving the spoolss pipe
  - **child** fully initialized idle daemon waiting to serve a connection
  - **child** only answers spoolss request
Enabling spoolssd

[global]
rpc_server:spoolss = external
rpc_daemon:spoolssd = fork
Settings

- Minimum children to be preforked (default: 5)
- Maximum children to be preforked (default: 25)
- Spawn rate (default: 5)
- Maximum allowed clients (default: 100)
- Shortest lifetime of a child (default: 60 sec)
spoolssd tuning variables

[global]
spoolssd:prefork_min_children = 1
spoolssd:prefork_max_children = 1
spoolssd:prefork_spawn_rate = 0
spoolssd:prefork_max_allowed_clients = 100
spoolssd:prefork_child_min_life = 0
Minor things or other stuff

- The default directories for drivers are created by smbd now
- Fixed driver installation for Windows 8 (only driver version 3 is supported)
- There is also a LSA Service Daemon (lsasd) doing LSARPC, SAMR, NETLOGON
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Why a new protocol?

Print System Remote Protocol (MS-RPRN) is still the core of printing in Windows. RPRN has several design limitations.

- Synchronous protocol
- Change notifications require print client to provide a print server as well
New features of PAR

- Covers majority of RPRN functionality (72 methods (RPRN: 113 methods))
- Asynchronous DCE/RPC
- Inherits RPRN data messages and buffer formats
- Uses only ncacn_ip_tcp transport
- Usage of object_ids at the DCE/RPC layer
Change Notifications in RPRN

- Client registers for change notifies
- Server opens new connection to the client for notifications
- Firewalls often forbid opening TCP/IP connections to desktops
- Anonymous access to spoolss pipe disabled by default
- When blocked, client needs to manually refresh / pull notifications
Change Notifications in RPRN

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Change Notifications in PAR

- Client registers for change notifies
- Client asks to receive change notifies, reply does not return until matching notification has been sent
- No printserver on the client needed
Change Notifications in PAR

 RpcAsyncOpenPrinter

 RpcSyncRegisterForRemoteNotifications

 RpcAsyncGetRemoteNotifications

 Does not return until matching notification is issued
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Client Prerequisites

- Both DCE/RPC client libraries support dynamic endpoints over ncacn_ip_tcp
- object_ids are supported
- smbtorque/rpcclient testcode
- idea: PAR based print notification library
Server Prerequisites

- Asynchronous DCE/RPC Server (currently only in the s4 RPC server)
- Endpointmapper with ncacn_ip_tcp transport
- PAR to RPRN redirection
Questions & Answers

- Slides http://www.samba.org/~asn/