



Release Notes

**Dialogic[®] Brooktrout[®] Fax Service
Provider for Microsoft[®] Fax Server**

Version 6.7.4

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Introduction to the Dialogic® Brooktrout® Fax Service Provider (FSP) for Microsoft Fax Server

The Microsoft Fax Server which is distributed with your Windows Operating System provides the ability to fax any printable document and to receive faxes when used with a fax service provider (FSP) and a fax-capable device. The Dialogic® Brooktrout® FSP Software provides these fax processing capabilities when used with the following Brooktrout Fax Products:

- Dialogic® Brooktrout® TruFax® Fax Boards – Analog and BRI ISDN
- Dialogic® Brooktrout® TR1034 Fax Boards – Analog, BRI ISDN, DID, T1, E1, and Ethernet (FoIP)
- Dialogic® Brooktrout® SR140 IP Fax Software – SIP/H.323, T38/G711 Fax over IP

New Features in the Dialogic® Brooktrout® FSP 6.7.4

Windows 10

Added support for Windows 10 32-bit and 64-bit.

New Features in the Dialogic® Brooktrout® FSP 6.7.2

Low profile PCI Express TR1034

Support for the LP03 PCI express low profile TR1034 and TruFax® Analog boards.

New Features in the Dialogic® Brooktrout® FSP 6.7.1

Windows Server 2012 and Windows 2012 R2

Added support for Windows Server 2012 and Windows 2012 R2.

Changes in FSP 6.7.4 (From FSP 6.7.2)

This section lists the known issues/limitations on the product. These are classified in functional categories. The notation “IPYnnnnn” or “BRKT-nnnn” are used to reference a specific issue in Dialogic’s change request tracking database.

- **Enhancement BRKT-428**- Added support for Windows 10, 32-bit and 64-bit.

Changes in FSP 6.7.2 (From FSP 6.7.1)

This section lists the known issues/limitations on the product. These are classified in functional categories. The notation “IPYnnnnn” or “BRKT-nnnn” are used to reference a specific issue in Dialogic’s change request tracking database.

- **Enhancement BRKT-283**- Added support for the LP03 PCI express low profile TR1034 and TruFax® Analog boards.

Changes in FSP 6.7.1 (From FSP 6.5.5)

The following section describes the customer-visible issues that have been resolved in this SDK release. The notation “IPYnnnnn” is used to reference a specific issue in Dialogic’s change request tracking database.

- **Fixed IPY55543** – The default for Shared Fax setting on Windows 2008 was to answer the call after 5 rings. The default was updated to answer after 2 rings.
- **Fixed IPY57303** – If the user selects the FSP to be removed and then selects Cancel when prompted for verification of the removal, the SDK runtime package and the x64 components packages that are normally hidden become visible. This has been fixed.
- **Enhancement 10907** - The default filtersettings.cfg file used with brkcttrace has been updated to include FSP, TSP and routing extension items.

Supported Operating Systems

A supported operating system is one for which the Brooktrout FSP has been designed and tested.

The following versions of Windows® are supported:

- Windows Server® 2012 R2
- Windows Server® 2012
- Windows Server 2008 R2 (64-bit)
- Windows Server 2008, 32-bit and 64-bit version
- Windows 10, 32-bit and 64-bit version

Supported Hardware Platforms

The following table describes the supported hardware platforms for this release:

HW Platform	Form Factor	Telephony Bus	IP Interface	Maximum Channels
LP02 TruFax® Analog LP02 TR1034 Analog/DID	Half length, universal PCI	N/A	N/A	2 ALS 4 DID
LP01-L TR1034 Analog	Full length, universal PCI	N/A	N/A	8
LP01-B TR1034 BRI LP01-B TruFax® BRI	Half length, universal PCI	N/A	N/A	4
HP02-H TR1034 T1/E1	Full length, universal PCI	H.100	1	30
HP03-H TR1034 T1/E1	Full length, universal PCI	H.100	1	96
LE03 TR1034 Analog LE03 TruFax® Analog	Low Profile, PCI Express	N/A	N/A	2 or 4 ALS 2 ALS
LE02 TruFax® Analog LE02 TR1034 Analog/DID	Half length, PCI Express	N/A	N/A	2 ALS 4 DID
LE01-L TR1034 Analog	Full length, PCI Express	N/A	N/A	8
LE01-B TR1034 BRI LE01-B TruFax® BRI	Half length, PCI Express	N/A	N/A	4
HE01-H TR1034 T1/E1	Full length, PCI Express	H.100	1	30
HE02 TR1034 T1/E1	Low Profile, PCI Express	N/A	N/A	30

Note: The model name and number of your hardware platform also appears on a label on the circuit board.

Latest Hardware Regulatory Compliance can be found here: <http://www.dialogic.com/declarations/default.htm>

SR140 Products

There are three SR140 products, the original full SR140, the SR140-L and the SR140-FSP. Each product differs in the available functionality, with the full SR140 having the highest functionality. The tables below summarize the feature set available for the different SR140 products over the course of their release history.

Note: Full SR140, SR140-L and SR140-FSP licenses cannot co-exist in the same system with other SR140 license types.

Full SR140 Release History

Release	Date	Example Model Name	Feature Set
R1	Jul 2005	SR140-4F	<ul style="list-style-type: none">• T.38 V17• Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)
R2	Feb 2008	SR140-4F-V34	<ul style="list-style-type: none">• T.38 V34• T.38 V17• Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)
R3	Nov 2009	SR140-4-R3	<ul style="list-style-type: none">• G711 V34 fax pass-through• G711 V17 fax pass-through• IVR• T.38 V34• T.38 V17• Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)

SR140-L Release History

Release	Date	Example Model Name	Feature Set
R1	June 2010	SR140-L-4-R1	<ul style="list-style-type: none">• Maximum 8 channels per system• T.38 V17• Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)

SR140-FSP Release History

Release	Date	Example Model Name	Feature Set
R1	June 2010	SR140-LL-4-FSP-R1	<ul style="list-style-type: none">• Maximum 8 channels per system• T.38 V17

Supported SR140 Virtual Modules

This Brooktrout FSP release supports SR140 host-based fax (HBF) modules, available in the following configurations:

SR140 Full

Available in 2, 3, 8, 12, 22, 24, 30, 48, and 60 channel configurations, as well as 2-channel demo licenses. These configurations can be combined to support between 1 and 120 channels in a single server, depending upon your application. DEMO license types cannot be combined.

SR140-L

Available in 2, 4, and 8 channel configurations as well as 2-channel demo licenses. These configurations can be combined to support between 1 and 8 channels in a single server, depending upon your application. DEMO license types cannot be combined. Upgrades are also available to add the functionality of a full SR140 license.

SR140-FSP

The SR140-FSP product can only be used with Microsoft Fax Server and the Brooktrout FSP. Available in 2, 4, and 8 channel configurations as well as 2-channel demo licenses. These configurations can be combined to support between 1 and 8 ports in a single server, depending upon your application. DEMO license types cannot be combined.

Supported Fax over IP Equipment

For the latest listing of Dialogic® Brooktrout® FoIP interoperability information, refer to the following site:

<http://www.dialogic.com/interoperability/fax.htm>

This list includes hardware devices (and their respective software revisions) that have been tested for interoperability with the SR140 software:

- IP PBX
- Gateways
- Other devices

The Brooktrout FSP will interoperate with other T.38 routers and gateways due to standards compliance and similarities with other tested equipment. Routers from other vendors may interoperate, but have not been specifically tested by Dialogic.

System Configurations

The following sections list recommended system configurations. The Brooktrout FSP may operate properly in systems containing more ports than shown here, but Dialogic has not tested systems other than the configurations listed in this section.

The number of channels available for a system depends upon multiple factors, including the following:

- Number of fax devices supported by your operating system
- For Trufax and TR1034 installations the board type, and number of boards supported in a single system
- For SR140, the SR140 product type
- System processor, memory, and expansion slot specifications

Hardware-based applications

The following tables list the maximum number of ports recommended for each hardware platform and minimum system requirements to support these densities. System requirements are representative of configurations tested by Dialogic.

Hardware System Density Requirements

Hardware Platform	Operations	Recommended System Density	
		Max ports	Max boards
LP01-L TR1034 Analog	V.34 Fax	32 ports	4 boards
LP01-B TR1034 BRI	V.34 fax	16 ports	4 boards
LP01-B TruFax® BRI	V.17 fax	16 ports	4 boards
LP02 TR1034 Analog/DID	V.34 fax on ALS, V.17 fax on DID	16 ports	4 boards
LP02 TruFax® Analog	V.17 fax	8 ports	4 boards
HP02-H TR1034 1 T1/E1	V.34 fax over T1/E1 or fax over IP	120 ports	4 boards
HP03-H TR1034 1 T1/E1 or 1 Ethernet	V.34 fax over T1/E1 or fax over IP	384 ports (V17) 240 ports (V34)	4 boards
LE01-L TR1034 Analog	V.34 Fax	32 ports	4 boards
LE01-B TR1034 BRI	V.34 Fax	16 ports	4 boards
LE01-B TruFax® BRI	V.17 fax	16 ports	4 boards
LE02 TR1034 Analog/DID	V.34 fax on ALS, V.17 fax on DID	16 ports	4 boards
LE02 TruFax® Analog	V.17 fax	8 ports	4 boards
LE03 TR1034 Analog	V.34 Fax	16 ports	4 boards
LE03 TruFax® Analog	V.17 fax	8 ports	4 boards
HE01-H TR1034 1 T1/E1 or 1 Ethernet	V.34 fax over T1/E1 or fax over IP	120 ports	4 boards
HE02 TR1034 1 T1/E1	V.34 fax over T1/E1	120 ports	4 boards

Hardware System Density Requirements

Intel System Performance Requirements

Max Number of Ports	Processor	Memory	Max Number of Boards
192	Pentium 4 2.4 GHz	512 MB	2
240	One or Two Xeon 2.0 GHz	1 GB	4

SR140 (Host-based) applications

Number of channels supported by each SR140 product in a single system is as-follows:

Full SR140	120 channels
SR140-L	8 channels
SR140-FSP	8 channels

Brooktrout FSP, SR140, and Virtual Machines

Virtual machines work by time-sharing host physical hardware, and virtual machines cannot exactly duplicate the timing behavior of a physical machine. Differences and timing inaccuracies vary depending upon many factors including the hardware, type and version of VM, Operating System version, and the utilization of the hardware by applications on the same or other virtual machines.

Hyper-V

The Brooktrout FSP is supported for Hyper-V version 6.1.7600.16385 or later using the SR140 with any client OS supported by the Brooktrout FSP.

VMware

The Brooktrout FSP is supported for ESXi Server version 4.0.0 or later within the 4.x product line using the SR140 with any client OS supported by the Brooktrout FSP.

Xen

The Brooktrout FSP is supported for Citrix Xen 5.5.0 or later using the SR140 with any client OS supported by the Brooktrout FSP.

Software Installation

Please refer to the *Dialogic® Brooktrout® Fax Service Provider Installation and Configuration Guide*. The Brooktrout FSP software distribution package includes all user documentation in the */Documents* directory.

For SR140 products, a license must be activated following the procedure listed in the *Brooktrout End User Guide* included with this distribution. Trufax and TR1034 products do not require license activation.

Usage Notes

Demonstration Mode

The Brooktrout FSP comes with a Demonstration License Activation Key. To activate the demonstration mode, select *Use license key provided with my application* from the License Manager Activation Menu. Alternatively you can use this License Key (746736532978) via www.dialogic.com/activation (or email/fax) to obtain a demonstration of a 2 channel SR140-FSP product. Please contact sales if you wish to demonstrate different SR140 products.

You must use a configured gateway when using the SR140

The Microsoft Fax Server does not allow the user to pass non-numeric characters in the dial-string, therefore the gateway cannot be specified in the dial-string, and must be configured using ConfigTool.

SIP URI Considerations

SIP URI's must conform to RFC 2396-Uniform Resource Identifiers (URI) Generic Syntax. Any reserved character that is required to be passed to the remote device in a SIP URI must be escaped before forming the URI. An escaped octet is encoded as a character triplet, consisting of the percent character "%" followed by the two hexadecimal digits representing the octet code. For example, "%2C" is the escaped encoding for the US-ASCII comma character.

Interoperating in a network consisting of V.34 T.38 capable devices

If the equipment you are communicating with includes V.34 T.38 capable devices; for example the Dialogic® 4000 Media Gateway Series, and any other non-V.34 T.38 equipment can correctly negotiate the T.38 fax version, you can change the default settings to support V.34 as follows:

```
t38_fax_version = 3
t38_max_bit_rate = 33600
rtp_ced_enable=false
```

Interoperating with Cisco V.34 T.38 capable devices

- For outbound V.34 T.38 calls (SR140 to Cisco) to succeed without falling back to V.17, the `callctrl.cfg` parameter `media_renegotiate_delay_outbound` must be changed to a value equal to or greater than zero. This change implies that the SR140 will initiate a T.38 changeover. The `media_renegotiate_delay_outbound` parameter is set to -1 by default. In the Configuration tool, this parameter can be found on the 'T.38 Parameters' tab of the 'IP Call Control Modules' section.
- Cisco IOS versions that support V.34 T.38 have added a new parameter, 'version', to the 'fax protocol t38' command. This parameter must be set to 3 in order to enable V.34 T.38 operation since the third version of the ITU-T's T.38 specification added V.34 support. This parameter can be set in the global configuration or an individual dial peer.

Global configuration example:

```
!
voice service voip
    fax protocol t38 version 3 ls-redundancy 0 hs-redundancy 0 fallback none
sip
```

```
!  
Dial peer configuration example:  
!  
dial-peer voice 4443 voip  
  destination-pattern 4443  
  session protocol sipv2  
  session target ipv4:10.10.10.1  
  session transport udp  
  voice-class codec 1  
  fax protocol t38 version 3 ls-redundancy 0 hs-redundancy 0 fallback none  
!
```

Interoperating with ShoreTel gateways

- Enabling redundancy for T.38 causes data errors when using the ShoreTel Gateway Software Release 10 Build 15.6.4207.0. For interoperability, the SR140 requires redundancy for both image and control to be set to 0.
- The ShoreTel Gateway sends a SIP session refresh if it is enabled on the ShoreTel Gateway, even if the SR140 is configured not to use SIP session refresh. This will cause the SR140 to drop the call if a SIP refresh is received. For interoperability, the SR140 must enable SIP session refresh or the ShoreTel Gateway must disable SIP session refresh by using the ShoreWare Director (select Call Control, then Options, then disable the session timer, and set the session interval and the refresher).
- The ShoreTel Gateway does not support V.17 for T.38. The maximum protocol supported is V.29 (9600 bits/sec).

Interoperating with Avaya gateways, Alcatel gateways and the BroadSpeed SIP trunking service

Due to lack of T.38 Error correction mode (ECM) support on the Avaya gateway, faxes containing errors caused by possible telephone line conditions are more likely to fail and therefore affecting the overall fax completion rate under these specific conditions.

Tracing G711 RTP using wireshark

Wireshark decodes all G711 packets as T.38 after a SIP re-REINVITE or H245 requestMode for T.38 is rejected. https://bugs.wireshark.org/bugzilla/show_bug.cgi?id=2368

Systems with Intel 5500 Series or 5600 processors

We would recommend disabling C-state support in the BIOS and/or OS of systems with Intel 5500 or 5600 processors; this may be referred to as CPU Power Saving Mode. This recommendation is due to Intel Errata AAK120 *Rapid Core C3/C6 Transition May Cause Unpredictable System Behavior* which affects all steps (C-0, C-1, D-0) of the 5500 Series processor and BD59 *Package C3/C6 Transitions When Memory 2x Refresh is Enabled May Result in a System Hang* affecting all steps (B-1) of the 5600 Series processors. In particular we experienced erratic timing behavior on Intel 5500 based systems during testing of Red Hat 6.0, which added support for the C6 Intel C-State.

Fax Pass-through (G711 RTP) Design Consideration

G711 RTP is more sensitive to network impairments than T38. Please refer to Appendix A for a section on design considerations to help provide guidance to those deploying G711 RTP.

Known Issues and Limitations

This section lists the known issues/limitations on the product. These are classified in functional categories. The notation “IPYnnnnn” or “BRKT-nnnn” are used to reference a specific issue in Dialogic’s change request tracking database.

Installation, packaging and configuration

- IPY98863 – PCIe Trufax and TR1034 boards may not function in Dell PowerEdge T1102 or T1101 servers. This is due to a problem with the PowerEdge BIOS. A new BIOS release to fix this issue is planned for release by September 26, 2012. More information can be obtained here:
http://www.dialogic.com/support/helpweb/helpweb.aspx/3362/driver_unable_to_communicate_with_pci_express_boards_in_dell_poweredge_t110x/TR1034

Call Control

- BRKT-229, IPY54298 – On single-span digital TR1034 models, using R2 signaling, an MFR2 call might be dropped when all channels receive or originate calls simultaneously. The dropped calls will return with "Misc error: Channel not in connected state" errors.
- BRKT-231, IPY54142 - When using H.323, fast-start and no tunneling. With certain remote devices the connect message will not be sent when the remote end has disabled tunneling and is configured for fast-start. The symptom is inbound calls not sending the connect message to the remote end. The workaround is to enable tunneling on the remote end.

Fax

- BRKT-118, IPY56054, IPY56116 – Cisco 2821 using V34 T38. When using V34 T38 on a Cisco 2821, received faxes may fail returning various hangup codes. The greater the number of simultaneous channels using T38 V34 on the 2821, and the more complex the image, the higher the failure rate. Cisco TAC 617057035.
- BRKT-131, IPY56586, IPY56587, IPY56586 - Cisco 2901 using V34 T38. Sent or received faxes may fail returning various hangup codes. This is due to a variety of issues including; all calls to non-V34 fax devices failing, in V17 mode all faxes would be limited to 9600bps and ECM mode disabled. Cisco TAC 6107057091, 617057073 and 615450733.
- BRKT-126, IPY56389 - SR140 V34 G711 fax pass-through on Virtual Machines (VMs) not supported. VMs work by time-sharing host physical hardware, and they cannot exactly duplicate the timing behavior of a physical machine. Timing inaccuracies vary depending upon many factors including the hardware, VM, VM configuration, Client Operating System, and the utilization of the hardware by applications on the same or other VM clients. V34 G711 fax pass-through is very sensitive to these VM timing inaccuracies, causing various fax failures which increase with high loads. We are actively researching solutions to better address this.

Deprecated functionality

This section lists functionality which is supported in this release, but is not recommended for new designs because it will not be supported in a future release. For a list of currently unsupported functionality, please refer to the Brooktrout Bfv APIs Reference Manual.

Appendix A - Fax Pass-through (G711 RTP) Network Design Considerations

In spite of being similar in nature, voice and fax pass-through calls are affected differently by IP network impairments. Because fax pass-through calls' data cannot be altered during its transport, these calls are more susceptible to IP problems than voice calls. Voice calls may experience some degradation from certain network impairments, and the parties involved on the call might not even realize the degradation is occurring. In addition, there are mechanisms in place for most compressed audio codecs such as predictive algorithms and packet loss concealment techniques that can assist in masking many network problems. These techniques, however, do not protect fax pass-through transmissions.

Pass-through and T.38 fax calls may also respond differently to certain IP network impairments. The following table lists specific impairments and descriptions of how each one may impact T.38 and pass-through calls.

Impairment	Definition	Description
Packet Loss	A relative measure of the number of packets that were not received compared to the total number of packets transmitted.	Fax pass-through calls are very sensitive to packet loss, especially when carrying high-speed modem modulations. Lab testing shows that as little as 0.02 percent packet loss can cause pass-through calls to fail. T.38 fax calls may use the protocol's redundancy mechanism to handle substantially more packet loss than pass-through. It has been shown that T.38 calls can succeed with up to 10 percent random packet loss.
Delay	The finite amount of time it takes a packet to reach the receiving endpoint after being transmitted from the sending endpoint.	The recommendation for voice is to keep the one-way latency (mouth-to-ear) to less than 150 ms. In the case of fax pass-through and T.38 calls, delay is not typically as much of an issue as it can be for voice.
Jitter	The delay variation between packets or the difference in the end-to-end delay between packets.	Average one-way jitter of less than 30 ms is the recommendation to ensure voice QoS. With T.38 and fax pass-through, average jitter less than 30 ms is not quite as critical.
Clock Skew	The running sum of the differences between when packets actually arrive at a destination and when they were expected.	Synchronization issues between a voice gateway and an IP endpoint are more critical for fax pass-through than for T.38 and voice. When using the pass-through transport method for long fax calls, there can be issues because of the lack of clock synchronization between the DSPs on the voice gateway and an IP endpoint. The gateway and endpoint use different clocks therefore, a clocking discrepancy, ever so slight in some cases, will always exist between the rates that packets are generated and consumed. This slight clocking discrepancy can cause playout buffer underrun/overrun on the voice gateway, which can result in bad image lines or PPRs in Error Correction Mode (ECM).

It should also be noted that Voice Activity Detection (VAD) and silence suppression should be disabled for fax pass-through calls on gateways that do not already perform this action upon detection of fax signals. This is needed in order to avoid fax signal clipping that can be caused by VAD algorithms that are used to suppress silence in voice calls.