TPF Toolkit Enhancements

Development Tools Subcommittee

Matt Gritter

2024 TPF Users Group Conference
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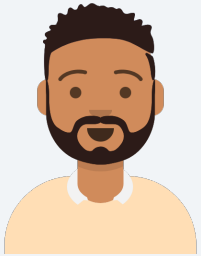
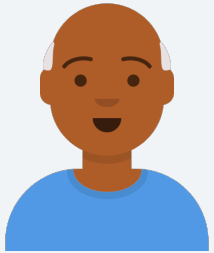
Users



Zach

Application developer

My role is z/TPF development. That includes writing and debugging code. My role also includes developing automated test framework test cases, running code coverage, and similar tasks.



Derrick

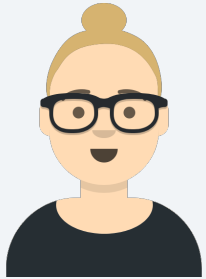
z/TPF administrator and operator

As a z/TPF administrator and operator, I'm the eyes and ears of the system. I'm constantly overseeing the system and learning when something is off. I also perform administration tasks, such as security configuration.

Arthur

TPF Toolkit administrator

My role is to make TPF Toolkit and any fix packs available for installation, create customizations, assist users with problems, maintain the TPF Toolkit web application, and similar tasks.



Christine

Security administrator

My role includes ensuring adherence to business security requirements.

What’s new in TPF Toolkit 4.6

4.6.17 – Released August 2023

- Eclipse platform and Java upgrade
- Support for asterisks in workstation IP addresses for debug sessions
- z/TPF secure file transfer (APAR PJ46830 - July 2023)

4.6.18 – Released April 2024

- Secure debugger connections (APAR PJ47187 - April 2024)

Eclipse platform and Java upgrade

Problem:

- Eclipse 4.8 was reaching end of service
- Security vulnerabilities in Java 8
- APIs deprecated and marked for removal

Arthur
TPF Toolkit administrator

Solution: Upgraded to Eclipse 4.23 LTS and IBM Semeru Runtime Open Edition 17 (Java 17)

Value:

- Long-term Support
- Increased security
- Extended APIs and libraries
- Improved performance

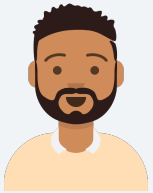
Delivered in Fix Pack 4.6.17

Learn more... IBM Community Blog – TPF Toolkit 4.6 Fix Pack 17

Support for asterisks in workstation IP address

Problem: When working remote

- Registering a debug session fails if the wrong workstation IP address (not the VPN assigned) is chosen by TPF Toolkit from the list of IPv4 addresses
- A debug session fails because the wrong workstation IP address is associated to an existing registration entry on the z/TPF system. This occurs because a new workstation IP address is assigned after disconnecting and reconnecting the VPN.
- User has to re-register or update preferences as a workaround



Zach
Application developer

Solution: Provide support for the Workstation Address field in the TPF Debug preference page to accept an asterisk (*) in any of the octets so that TPF Toolkit can choose the correct IP address.

Value: Debug connections work all the time without any manual intervention, regardless of whether you work from the office or a remote location.

Delivered in Fix Pack 4.6.17

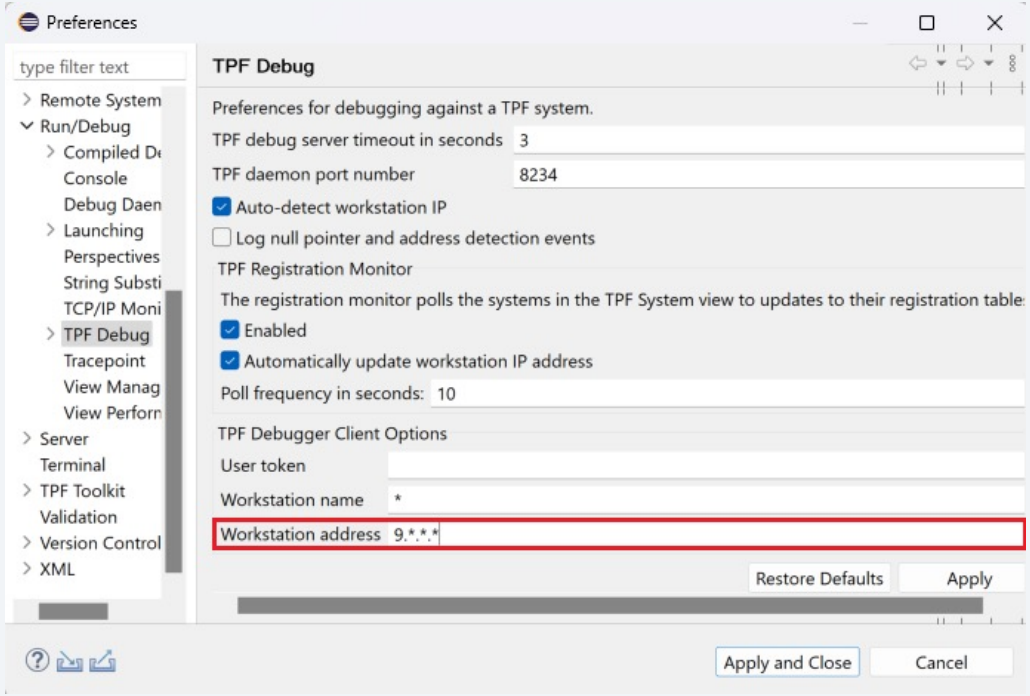
Learn more... IBM Community Blog – TPF Toolkit 4.6 Fix Pack 17

Support for asterisks in workstation IP address (continued)

Configure the workstation IP address with asterisks in any octet so that only the correct VPN assigned IP address is used when registering a debug session.

For example, you can specify 9.*.*.* in the Workstation Address field so that only the IP address that starts with a 9 is used.

If the Automatically update workstation IP address checkbox is selected, TPF Toolkit will choose and update the correct local workstation IP address if your local workstation IP address changes during a debug session when the VPN disconnects and reconnects again.



z/TPF secure file transfer

Problem: The use of unsecure protocols is becoming increasingly difficult, if not impossible, to justify.

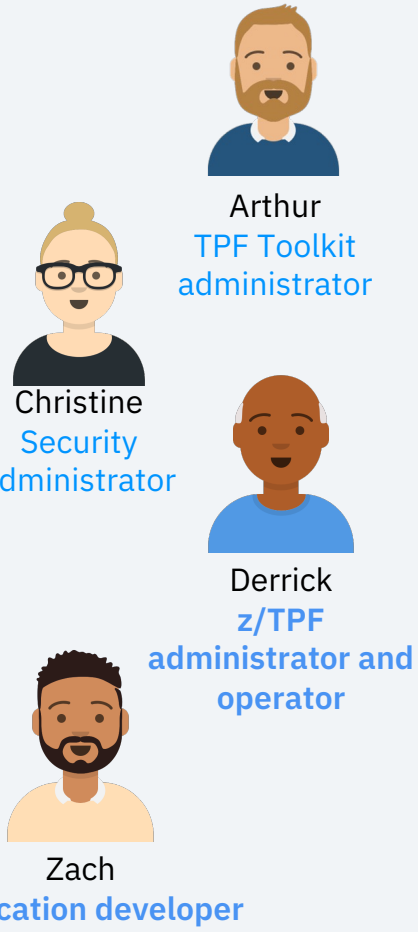
Solution: APAR PJ46830 implemented an SSH server, which provides the support to securely transfer files to the z/TPF system. MakeTPF tools were updated to use a secure FTP connection.

Value:

- Load actions in TPF Toolkit can now use the loadtpf utility to transfer loadsets securely to the z/TPF system.
- An SSH remote connection can now be configured using the Remote System Explorer to securely browse and update files on a z/TPF system.

APAR PJ46830 delivered in July 2023

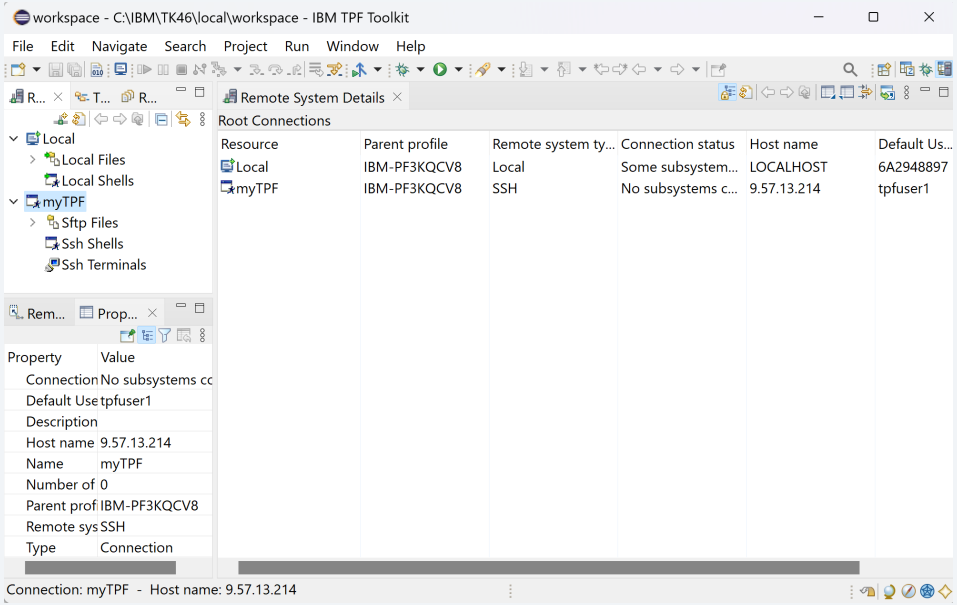
Learn more... IBM Community Blog – z/TPF secure file transfer

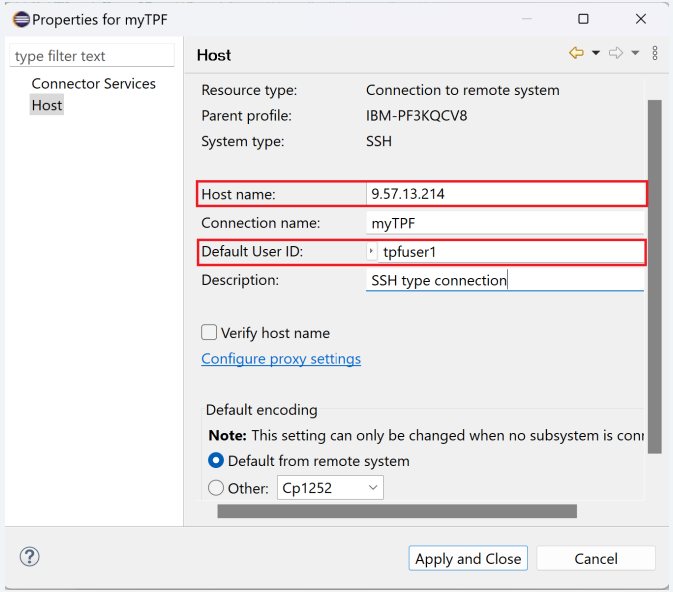


z/TPF secure file transfer (continued)

With APAR PJ46830 applied to your z/TPF system and the SSH server configured and started, you can securely connect to the z/TPF system in the Remote Systems view by using an SSH connection.

From the **Remote Systems** view, add an SSH entry with a defined user ID (for example, tpfuser1) and the hostname or IP address.



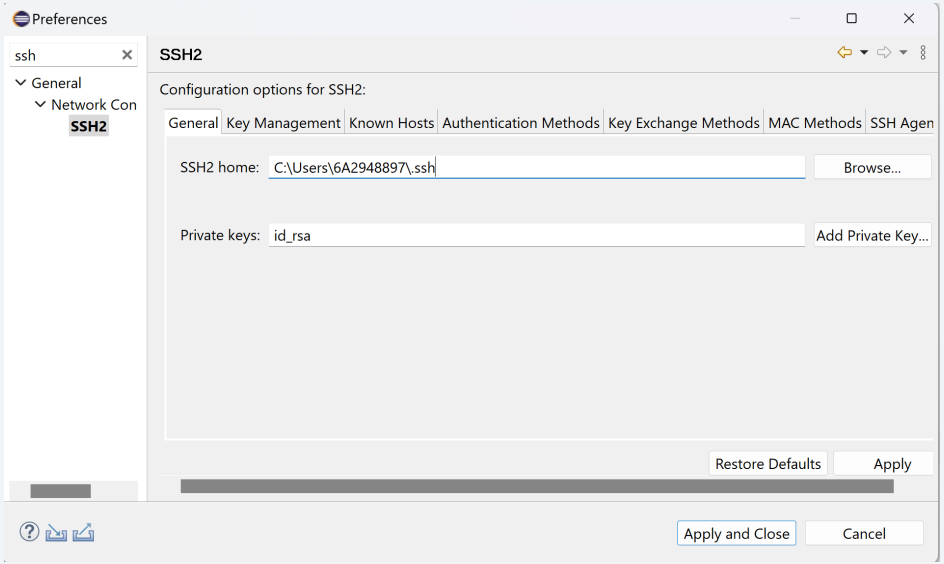


z/TPF secure file transfer (continued)

Generate a key in TPF Toolkit from the SSH2 preference page. The generated private (id_rsa) and public key(id_rsa.pub) files will reside in C:\Users\<userid>\.ssh\ folder

Add the private key to the General tab of the SSH2 preference page and share the public key file to your z/TPF administrator.

On the z/TPF system, when the administrator grants access to the SSH server for the z/TPF user ID and the public key file is stored in the authorized_key directory, you can use the Remote Systems view to securely access your z/TPF file system.



Secure debugger connections

Problem: The use of unsecure protocols is becoming increasingly difficult, if not impossible, to justify.

Solution: All debugger connections from TPF Toolkit and the TPF Toolkit web application services to a z/TPF system can now use secure calls over TLSv1.2. With APAR PJ47183 applied, TLSv1.3 will also be supported.

Value:

- All data flowing between TPF Toolkit and the z/TPF system is encrypted
- Security administrators don't have to worry about security scans flagging the workstations and z/TPF systems as vulnerable to attacks

Delivered in Fix Pack 4.6.18 and APAR PJ47187

Learn more... IBM Community Blog – Secure Debugger Connections

Arthur
TPF Toolkit administrator

Derrick
z/TPF administrator and operator

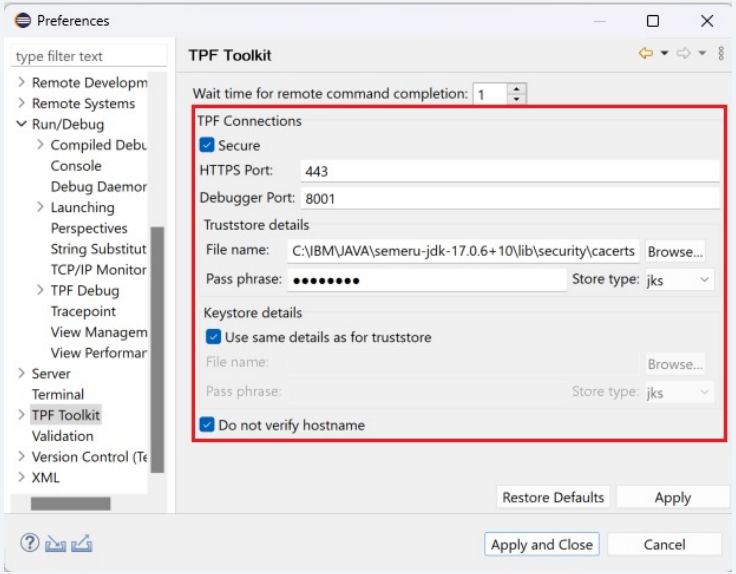
Christine
Security administrator

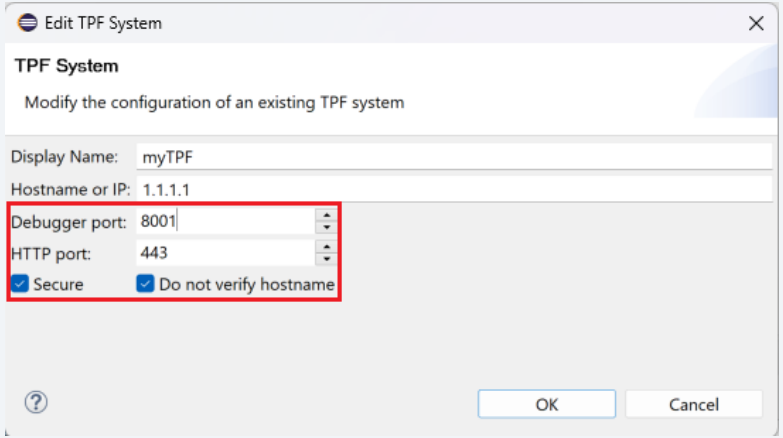
Secure debugger connections (continued)

Administrator will set the default secure debugger port in TPF Tookit preferences

A new z/TPF system definition inherits the values from TPF Toolkit preferences

Import the CA certificate into the truststore if it does not already exist



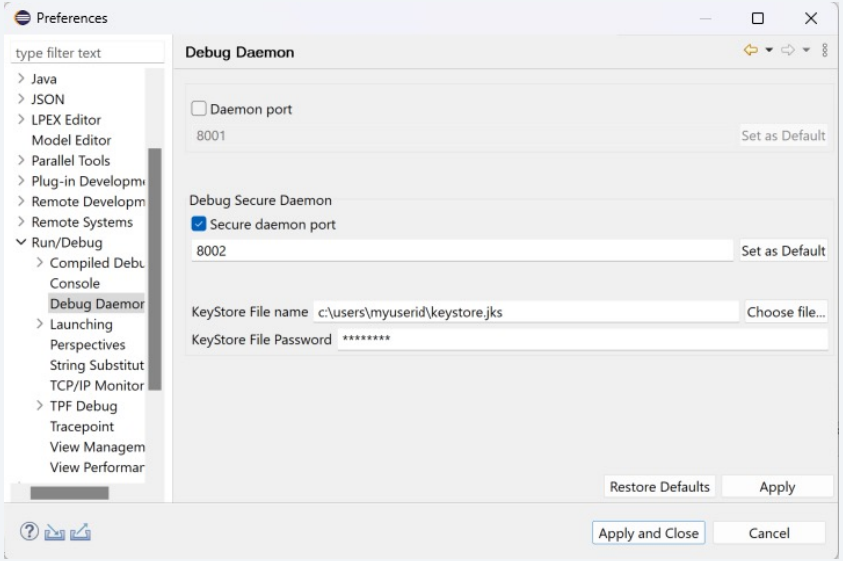


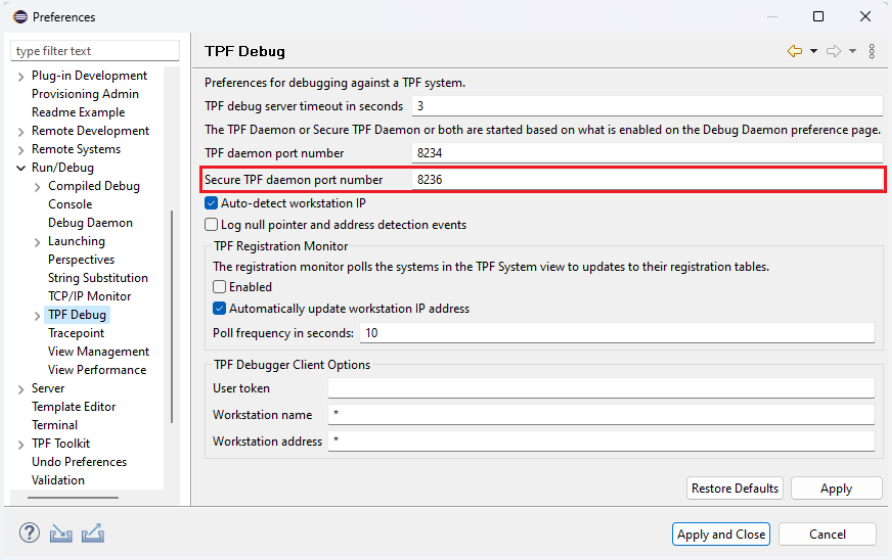
Secure debugger connections (continued)

Set the debug daemon configuration in TPF Toolkit using the Debug Daemon preference page.

A keystore with a server certificate is required by the debug daemon.

TPF daemon uses the same keystore details as the debug daemon. The secure TPF daemon will listen for secure connections if the debug daemon is configured to be secure.





Secure debugger connections (continued)

Debug server configuration on the z/TPF system for the server and client connections

1. Set up the TLS configuration file /etc/ssl/dbug/dbug.conf

```
VERSION= TLSv1_2
CIPHER= ECDHE-RSA-AES256-SHA384,ECDHE-RSA-AES256-GCM-SHA384,AES256-GCM-SHA384,AES256-SHA256
CERTIFICATE=/certs/ntpf2048_cert.pem <--- Server certificate signed by Root CA or Intermediate CA or Self-signed
KEY=/tpfpubk/ntpf2048.pem            <--- Private key
VERIFYPEER=NO                        <--- Disable client authentication
#For client connections
CAINFO=/certs/cacert.pem             <--- Root Certificate of the CA that signed the server certificate for Debug Daemon
```

2. Define the secure debug server and start it

```
ZINET ADD SERVER-DBUG PGM-CDBI MODEL-DAEMON ACT-AUTO STATE-1052 XPARM-secure port 8001
ZINET START S-DBUG
```

What’s next?

- ❖ Implement updates to the z/TPF service descriptors - Target 3Q2024
  - APAR PJ46818 added REST throttling support properties to the z/TPF service descriptors
- ❖ Implement updates to REST artifact generation (tpfrestgen) - Target 3Q2024
  - APAR PJ46782 tpfrestgen support for pragma pack added a new option –p to specify the size to set the pack alignment for the generated C structures
- ❖ Eclipse platform upgrade (4.31 LTS or later) - Target 4Q2024

- ❖ Add Name-Value Pair (NVP) area to the z/TPF Debugger dumps and make it easy to find in TPF Toolkit – beginning high level design
- ❖ Integrate code coverage with automated test framework – beginning high level design

Conclusion

- TPF Toolkit documentation
- IBM Media Center: TPF Toolkit demo videos
- Blog
- Ideas – We're always open to ideas to improve TPF Toolkit. If you are interested in talking about any ideas, contact Kishore Nagareddy (kishoren@us.ibm.com)

Thank you

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