

## Microsoft Azure Service Fabric 6.5 Release Notes

This release includes the bug fixes and new features described in this document. This release includes runtime, SDKs, Service Fabric Tool and Windows Server Standalone deployments to run on-premises.

The following packages and versions are part of this release

<b>Service Fabric Runtime</b>	Ubuntu	<i>6.5.435.1</i>
	Windows	<i>6.5.639.9590</i>
<b>Service Fabric for Windows Server</b>	Service Fabric Standalone Installer Package	<i>6.5.639.9590</i>
<b>.NET SDK</b>	Windows .NET SDK	<i>3.4.639</i>
	Microsoft.ServiceFabric	<i>6.5.639</i>
	Reliable Services and Reliable Actors	<i>3.4.639</i>
	ASP.NET Core Service Fabric integration	<i>3.4.639</i>
<b>Java SDK</b>	Java for Linux SDK	<i>1.0.5</i>
<b>Service Fabric PowerShell and CLI</b>	AzureRM PowerShell Module	<i>0.3.15</i>
	SFCTL	<i>8.0.0</i>
<b>Service Fabric Tooling</b>	Visual Studio Tooling	<i>2.4.11116.1</i>
	Eclipse Tooling	<i>2.0.7</i>

## Contents

Microsoft Azure Service Fabric 6.5 Release Notes .....	1
<b>Breaking announcements</b> .....	<b>3</b>
<b>What New in 6.5</b> .....	<b>4</b>
<b>New Features</b> .....	<b>4</b>
Service Fabric Runtime .....	5
Service Fabric .NET SDK .....	14
Service Fabric PowerShell and CLI .....	15
Repositories and Download Links .....	16
Visual Studio 2015 Tool for Service Fabric – localized download links.....	19

## Breaking announcements

- This is the last release where we are releasing the Visual Studio tools for Service Fabric for VS 2015. Customers are advised to move to **VS 2019**.

## What New in 6.5

This release includes supportability, reliability, performance improvements, new features, bug fixes and enhancements to ease cluster and application life cycle management.

### New Features

- [Service Fabric Explorer will now allow you to explore the applications that you have uploaded to image store.](#)
- [Patch Orchestration Application\(POA\)](#) customers are recommended to move to released version [1.4.0](#) that has a lot of self-diagnostic improvements.
- [EventStore Service will be enabled by default for clusters](#) from this release unless a customer has specifically opted out.
- [Add replica level service fabric health events for Stateful Services](#)
- [Users will have better visibility into state of down seed nodes.](#)
- [Service Fabric Application Disaster Recovery tool](#) allows users of Service Fabric stateful services to get back live soon in case the primary SF cluster encounters a disaster. The tool constantly synchronizes the data from the application running on the primary cluster on the standby application on secondary using periodic backup and restore.
- [Support for .NET Core applications built from Visual Studio to be published to Linux Service Fabric cluster.](#)
- [Azure Service Fabric CLI \(sfctl\)](#) will be installed automatically from 6.5 onwards when you upgrade or create new Azure Service Fabric Linux cluster.
- [SFCTL](#) is installed by default on MacOS/Linux OneBox cluster.

## Service Fabric Runtime

Versions	IssueType	Description	Resolution
Ubuntu 6.5 Windows 6.5	Feature	Improve reliable collection replicator retry logic	<b>Brief desc:</b> When there is network congestion or if secondary is slow in receiving messages, replicator would still try to flood the secondary with retries. This can exacerbate the problem. This feature improves the replicator retry mechanism. <b>How/When to Consume it:</b> Feature is enabled by default
Windows 6.5	Bug	FabricInstallerSvc no longer writes a dump when timing out as part of it retry loop starting FabricHost.	<b>Impact:</b> Excess noise for cluster health telemetry and unnecessary network usage when Fabric is not coming up. <b>Fix:</b> Change logic to do silent retry.
Ubuntu 6.5 Windows 6.5	Bug	Made performance improvements for scalemin (onebox/more nodes than machines) scenario cluster setup and reset, by avoiding unnecessary file copies.	<b>Impact:</b> SDK single machine or scalemin clusters previously had their own set of copies for Fabric service files for legacy reasons, resulting in slow cluster setup. <b>Fix:</b> This was reworked to deprecate the need for each node to have its own set of copies of service files. <b>GitHub link:</b> <a href="https://github.com/Microsoft/service-fabric/issues/299">https://github.com/Microsoft/service-fabric/issues/299</a>
Ubuntu 6.5 Windows 6.5	Bug	In container setup code for Service Fabric runtime deployment, have removed waits and retries where they are not necessary.	<b>Impact:</b> Container configuration setup is behaving slowly for Service Fabric node setup & SDK upgrade. <b>Fix:</b> Improve granularity checking result codes for certain functional calls, to remove unnecessary waits.
Windows 6.5	Feature	SDK Service Fabric runtime installer now takes /force flag to automatically close conflicting processes.	<b>Brief desc:</b> For advanced users installing the SF runtime for the SDK setup scenario using the command line, can now pass /force flag to automatically close conflicting processes during the upgrade. Note: This does not apply for Windows system services. In addition, when not using the /force or /quiet flags, a modal dialog is presented to offer this functionality on demand, such as when installing through WebPI. <b>How/When to Consume it:</b> Using the runtime installer exe retrieved from WebPI/direct link, provide the new parameter through command line interface.
Windows 6.5	Feature	SDK Service Fabric runtime installer now takes /uninstall parameter for easy command-line uninstallation.	<b>Brief desc:</b> To bring parity with functionality available in the previously deprecated MSI installer, the SF runtime installer exe now takes an /uninstall parameter. <b>How/When to Consume it:</b> Using the runtime installer exe retrieved from WebPI/direct link, provide the new parameter through command line interface.
Windows 6.5	Bug	Fixed crash during node state removal.	<b>Impact:</b> In the cluster node removal path, in rare cases, calling NetCloseResource would hit a crash which had a risk of leaving artifacts behind during uninstall. <b>Fix:</b> Fixed marshaling casting issue that led to Arithmetic OverflowException.

<b>Ubuntu 6.5</b> <b>Windows 6.5</b>	<b>Feature</b>	Change compose application deployment to use the same workflow and store data structures with mesh application deployment in Cluster Manager.	<p><b>How/When to Consume it:</b>  When cluster upgrade to version 6.5, compose deployments old data structures will be removed and new data structures will be generated. Only completed compose deployments are migrated. To migrate successfully, cluster upgrade (from last 6.4 refresh release to 6.5 and 6.5 to lower version) and operations on compose based applications (create/upgrade/delete) are mutually blocking to each other. Fabric upgrade to 6.5 will fail if there is an operation on compose application not completed, and vice versa. To have this blocking logic, users of compose deployments must upgrade to 6.4 CU7 first and then upgrade to 6.5. Cluster upgrade that not across 6.5 will not be affected.</p> <p>The migration of compose applications is one way. If cluster is in 6.5 and then upgraded to a lower cluster version such as 6.4, migrated and newly created compose applications are still running but cannot be operated in lower cluster version. It is only changed internally. There are no visible public API changes. This change does not impact mesh application deployment.</p>
<b>Ubuntu 6.5</b> <b>Windows 6.5</b>	<b>Bug</b>	Accept new application upgrade if a previous application rollback fails during updating default services	<p><b>Impact:</b> If an application rollback fails when updating default services, a new application upgrade on the same application will fail.</p> <p><b>Fix:</b> Fix to accept a new application upgrade if previous application rollback fails during updating default services.</p>
<b>Ubuntu 6.5</b>	<b>Bug</b>	Service Fabric clusters on Azure can now be deployed using custom DNS.	<p><b>Impact:</b> Customers detailing a custom DNS server in their networking dhcpOptions would have a cluster fail to come up since Azure machine addresses cannot be resolved with the DNS server. The workaround was to add all cluster node address entries to the machine hosts files, to act as a stop gap.</p> <p><b>How/When to Consume it:</b> To activate custom DNS through an ARM Azure Service Fabric deployment, this configuration is required under ARM Microsoft.Network/virtualNetworks properties section (/w your chosen dns ip):</p> <pre> "dhcpOptions": {   "dnsServers": [     "8.8.8.8"   ] } </pre>
<b>Ubuntu 6.5</b>	<b>Feature</b>	General machine bootstrap script has been provided to set up prerequisites for Service Fabric Linux nodes for deployment & upgrade scenarios	<p><b>Brief desc:</b> A common machine prerequisite setup script <a href="#">bootstrap.sh</a> has been made available, in sync for each release of the SF runtime deb package. This allows for a consistent and future-proof prerequisite setup and upgrade process for Azure and on-premises Service Fabric Linux nodes.</p> <p>It sets up:</p> <ol style="list-style-type: none"> <li>1. Base environmental packages</li> <li>2. External dependency package repositories</li> <li>3. Service Fabric CLI (sfctl)</li> </ol> <p><b>How/When to Consume it:</b> Azure-deployed Service Fabric machines carry a script in the VM extension which is used to invoke the bootstrap script by deriving it from the deb package. The</p>

			helper script is called run_bootstrap.sh and the extension package can be retrieved from link: <a href="https://go.microsoft.com/fwlink/?linkid=2092882">https://go.microsoft.com/fwlink/?linkid=2092882</a>
<b>Ubuntu 6.5 (&amp; MacOS)</b>	<b>Feature</b>	SFCTL is installed by default on MacOS/Linux dev experience cluster container	<b>Brief desc:</b> When creating a container using the latest Service Fabric base container microsoft/service-fabric-onebox, the setup script will bootstrap the machine with sfctl installed automatically, removing the need to run separate steps to install the CLI. <b>How/When to Consume it:</b> MacOS/Linux dev container setup for container-based local cluster: <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-get-started-mac">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-get-started-mac</a>
<b>Windows 6.5</b>	<b>Feature</b>	EventStore Service will be added by default to Windows clusters when runtime gets upgraded to a version >= 6.5.	<b>Brief desc:</b> When clusters get created or upgraded with versions >=6.5, the EventStore Service is enabled by default. If a customer wants to disable it, this can be achieved by setting the eventStoreServiceEnabled property on the cluster resource to false (API version for cluster resource should be updated to 2019-03-01). <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-eventstore">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-eventstore</a>
<b>Windows 6.5</b>	<b>Feature</b>	Validation should not allow users to specify CPU shares without specifying number of required cores	<b>Brief desc:</b> With new validation during application manifest registration, Service Fabric does not allow specifying CPU shares at a code package/container level without setting the number of cores that is required. Reasoning behind this is that shares are used to split CPU time between different code packages/containers on the same machine. If customer already has an application where CPU shares are specified on code package level, but no CPU cores on service package level, this application will work with new fabric version. Customers must change the application manifest and add CPU cores on service package level to successfully upgrade their apps with newer service fabric versions.
<b>Windows 6.5</b>	<b>Feature</b>	Add replica-level Service Fabric Events to be used with Reliable Collections.	<b>Brief desc:</b> Added replica-level Service Fabric Events for Reliable Collections. <b>How/When to Consume it:</b> Explained in the first paragraph in: <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-event-generation-operational">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-event-generation-operational</a> <b>Documentation:</b> <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-event-generation-operational#replica-events">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-event-generation-operational#replica-events</a>
<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Bug</b>	Improve error reporting when a code package terminates unexpectedly.	Service Fabric would provide a health message that included only an error code when a Code Package terminated. It was difficult for users to know why their process/container terminated and take action to fix it. Service Fabric will now display a more descriptive health message with general debugging tips when a Code Package terminates. It will also include a link to more specific debugging information for common termination error codes.
<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Bug</b>	Move sf_cns plugin to a different port.	The sf_cns plugin runs on port 10090 (cns) and 48080 (cnm) by default. Teams are also using the azure cns plugin from GitHub that also runs on 10090 and 48080. Providing configuration-based support to run the sf_cns plugin on a different ports. The configuration controlling the sf_cns plugin ports are Hosting/SfCnsNetworkPluginCnsUrlPort (default is 10091) and Hosting/SfCnsNetworkPluginCnmUrlPort (default is 48081).

<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Bug</b>	Fixed Reverse Proxy crash of malformed URLs requests	Prior to 6.3 Reverse sf event would return 400 BadRequest, recently Reverse Proxy will crash if it receives a malformed request. This behavior was fixed such that it will again return 400 even if the URL is malformed.
<b>Windows 6.5</b>	<b>Feature</b>	Provide option to send telemetry on API usage through HTTP Gateway	<b>Brief desc:</b> API calls going through the HTTP endpoint can be collected as part of telemetry. Information may contain request URL, whether the operation was successful, error message, and the type of client the request came from, such as sfctl. <b>How/When to Consume it:</b> Feature is disabled by default. Feature can be turned on in the Diagnostics sections of FabricSettings, with configurations CaptureTelemetry and TelemetryCapturePercentage.
<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Bug</b>	DeletionManager should delete checksums first and fail if not able	<b>Brief Desc:</b> DeletionManager deletes part of a code package and errors out before it's able to finish (the deletion can fail on the OS side if it can't delete on of the files in the folder). The checksum remains along with part of the code package. If that ApplicationType is re-provisioned, then DownloadManager will see the checksum and that the folder is still there and not overwrite it. SF will now try to bring up an application with a half-missing code package. <b>Fix:</b> Fixed an issue where deleting files from a node would leave the cache in an error state
<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Bug</b>	Users can now specify a "TreatContainerUnhealthyStatusAsError" flag in the HealthConfig object of their ContainerHostPolicies.	Users can now specify a "TreatContainerUnhealthyStatusAsError" flag in the HealthConfig object of their ContainerHostPolicies. When set to true, any unhealthy statuses reported from a container's configured HEALTHCHECK will be treated as an error in Service Fabric's health reports.
<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Bug</b>	Fixed an issue causing externally terminated containers to be cleaned regardless of an AutoRemove policy.	<b>Brief desc:</b> If a container crashed or was terminated externally, we shouldn't remove the container. Whether the container is removed should be set during activation.
<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Bug</b>	ImageCache should clean up numbered temporary files on failed download	<b>Brief Desc:</b> Customer is reporting they're seeing a buildup of temporary download files in ImageCache. These files are created while being downloaded with a temporary name, and then renamed after download is complete. The files the customer is seeing are slightly smaller than their code package, leading me to believe they are an artifact left due to a failed download. <b>Fix:</b> Fixed an issue where temporary files were being left in the ImageCache after a failed download.
<b>Windows 6.5</b> <b>Ubuntu 6.5</b>	<b>Feature</b>	Auditing functionality added to REST api's	<b>Brief desc:</b> Information about the http requests (REST api's) will be logged to a well-known ETW channel under the SF Operational channel with keyword audit. This audit is configurable to turn on or off, only actions from users with admin credentials will be logged, and requests failed due to authentication will be ignored. The audit will include the credentials being presented, along with the request url and body.

			<b>How/When to Consume it:</b> Feature is disabled by default. Feature can be turned on in the Diagnostics sections of FabricSettings, by setting the configuration AuditHttpRequests to true.
<b>Remoting SDK 6.5</b>	<b>Bug</b>	Default Retry settings updated	<b>Brief desc:</b> We have changed the default retry settings for FabricTransientExceptions for Remoting from max to 10. Users will see FabricTransientExceptions and hence they need to handle those from this release onwards.
<b>Windows 6.5 Ubuntu 6.5</b>	<b>Feature</b>	New REST API to support querying image store folder size.	<b>Brief desc:</b> Service Fabric REST API support to return folder size in ImageStore. This REST API help SF explorer show folder information in ImageStore viewer tab. A user can see which folder consume large amount of space in storage and cleans up accordingly. /ImageStore/{contentPath}/\$/FolderSize Documentation: <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-visualizing-your-cluster#image-store-viewer">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-visualizing-your-cluster#image-store-viewer</a>
<b>Windows 6.5 Ubuntu 6.5</b>	<b>Bug</b>	Resource governance validation should not allow users to specify CPU shares on code package level without specifying the number of required cores on service package level	<b>Brief desc:</b> With new validation during application manifest registration, Service Fabric does not allow specifying CPU shares at a code package/container level without setting the number of cores that is required. Reasoning behind this is that shares are used to split CPU time between different code packages/containers on the same machine. If customer already has an application where CPU shares are specified on code package level, but no CPU cores on service package level, this application will work with new fabric version. Customers must change the application manifest and add CPU cores on service package level to successfully upgrade their apps with newer service fabric versions.
<b>Windows 6.5</b>	<b>Feature</b>	SF trace logs format changed to be CSV compliant	SF trace logs are made CSV compliant by enclosing message by double quotations after escaping (escape character: ") existing double quotations in the message. Custom tools developed by users that have a dependency on these logs need to modify the tools accordingly. <b>Example:</b> Previous trace in log file: 2019-5-15 01:47:48.091,Warning,1896,1756,Transport.FailedToConnect@68b5725aa0,client-10.0.0.11:19000/10.0.0.11:19000: error = 2147943625, failureCount=9. Filter by (type~Transport.St && ~(?)10.0.0.11:19000") to get listener lifecycle. Connect failure is expected if listener was never started, or listener/its process was stopped before/during connecting. <b>Current:</b> 2019-5-15 01:47:48.091,Warning,1896,1756,Transport.FailedToConnect@68b5725aa0,"client-10.0.0.11:19000/10.0.0.11:19000: error = 2147943625, failureCount=9. Filter by (type~Transport.St && ~""(?)10.0.0.11:19000""") to get listener lifecycle. Connect failure is

			<p>expected if listener was never started, or listener/its process was stopped before/during connecting.</p>
<p><b>Windows 6.5</b> <b>Ubuntu 6.5</b></p>	<p><b>Feature</b></p>	<p>Protecting system entities from runaway 'user' code</p>	<p>Few customers encountered problems due to runaway user services consuming all the resources on Service Fabric nodes. The resource exhaustion (spinning CPU, memory exhaustion, hammering disk IO, disk space exhaustion) resulted in several bad effects including starving other services on the nodes, nodes ending up in a bad state, complex mitigation and recovery steps, and unresponsive cluster management APIs.</p> <p>With this version of Service Fabric, you can now set up resource protection between the system and user services on a node. Service Fabric will enforce these hard resource limits for user services to guarantee that all the non-system services on a node will never use more than the specified amount of resources.</p> <p>This release adds an additional configuration option: <b>EnforceUserServiceMetricCapacities</b>. This config is in the PlacementAndLoadBalancing section of your ClusterManifest/ClusterConfig, and is OFF by default (to prevent unexpected surprises for existing customers during upgrades).</p> <pre>&lt;Section Name="PlacementAndLoadBalancing"&gt;   &lt;Parameter Name="EnforceUserServiceMetricCapacities" Value="true" /&gt; &lt;/Section&gt;  {   "name": "PlacementAndLoadBalancing",   "parameters": [ {     "name": "EnforceUserServiceMetricCapacities",     "value": "true" } ] }</pre> <p>This feature depends on Node Capacities for the Service Fabric resource governed <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-resource-governance">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-resource-governance</a> metrics (as of this writing Memory and CPU Cores) being set. These capacities can be set either automatically (<b>AutoDetectAvailableResources</b> flag is false) or manually. If no capacities are set, the node is considered to have infinite capacity for the given metric, and hence this feature cannot be used (since SF doesn't know how much resources to reserve for system services). SF will issue a health warning if "<b>EnforceUserServiceMetricCapacities</b>" is true but capacities are</p>

not specified.

The specified metric capacity for the node is then divided between the user services defines and the rest of the system. The amount dedicated to the user services vs. the amount dedicated to the system is controlled by the following settings:

```
<Section Name="PlacementAndLoadBalancing">
```

```
  <!-- 0.0 means 0%, and 1.0 means 100%-->
```

```
  <Parameter Name="CpuPercentageNodeCapacity" Value="0.8" />
```

```
  <Parameter Name="MemoryPercentageNodeCapacity" Value="0.8" />
```

```
</Section>
```

These ratios are defined by default. By default 80% of node capacity is used for user services and 20% will be left to allow enough resources for the SF system services (and also for any other processes/apps running on the node that are not visible to SF). These settings are static and upgrades to change them will require node restarts. User service capacity is enforced only for governed SF metrics (Memory and CPU Cores as of this writing). For non-governed metrics, it's treated as a soft guarantee (violations are possible, but if they happen, load balancer will trigger and attempt to fix the violation by moving services around, just like normal capacity violations). The SF system services are effectively **ungoverned**, and they can go beyond of their quota. Effectively constraining the system components and preventing them from growing beyond their allotment will be handled in an upcoming release.

With this change, user services metric capacity can also be defined per Node Type. T At the Node Type level, a new section is added named *UserServicesMetricCapacity*. Within this section, the same setting names and behavior can be defined and will result in the same behavior as described for the Cluster Manifest level settings. If metric capacity is defined in both places, node type definition takes precedence.

```
<NodeTypes>
```

```
  <NodeType Name="NodeType0">
```

```
    <UserServicesMetricCapacity>
```

```
      <Parameter Name="CpuPercentageNodeCapacity" Value="0.5"/>
```

```
      <Parameter Name="MemoryPercentageNodeCapacity" Value="0.7"/>
```

</UserServicesMetricCapacity>

</NodeType>

</NodeTypes>

This release also fixes an issue in the calculation of node capacities. The rule for calculating capacity has changed to account for percentage value (User Services Capacity = Node Capacity \* User Services Capacity Percentage)

Previously, if user provided an override value for node capacity in NodeType, the % value was ignored. This could be surprising to some users.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Node capacity auto-detected value	100	100	100	100
Node capacity user override	-	90	-	90
User services capacity default in cluster manifest	0.7	0.7	0.7	0.7
User services capacity default in Node Type	-	-	0.5	0.5
User services capacity - actual value	70	90	50	90

With this release, if user provides an override for the absolute capacity in NodeType, the % value is NOT ignored, and will further discount the available resources on the node.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Node capacity auto-detected value	100	100	100	100
Node capacity user override	-	90	-	90
User services capacity default in cluster manifest	0.7	0.7	0.7	0.7
User services capacity default in Node Type	-	-	0.5	0.5
User services capacity - actual value	70	63	50	45

## Service Fabric .NET SDK

Reliable Services and Reliable Actors X.Y.Z	<b>Feature</b>	Added replica-level Service Fabric Events to be used with Reliable Collections and KeyValueStore.	<b>Brief desc:</b> Added replica-level Service Fabric Events for stateful services. <b>How/When to Consume it:</b> Explained in the first paragraph in: <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-event-generation-operational">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-diagnostics-event-generation-operational</a> <b>Documentation:</b> <a href="https://docs.microsoft.com/azure/service-fabric/service-fabric-diagnostics-event-generation-operational#replica-events">https://docs.microsoft.com/azure/service-fabric/service-fabric-diagnostics-event-generation-operational#replica-events</a>
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## Service Fabric PowerShell and CLI

Versions	IssueType	Description	Resolution
SFCTL 8	Feature	As of Service Fabric on Linux 6.5 in Azure, sfctl is installed on machines by default.	<b>Brief desc:</b> Latest version SFCTL is installed on Service Fabric on Linux machines when creating a new cluster or upgrading a cluster to 6.5. <b>How/When to Consume it:</b> Automatic. <a href="https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-cli">https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-cli</a>

## Repositories and Download Links

The table below is an overview of the direct links to the packages associated with this release.

Follow this guidance for setting up your developer environment:

- Linux: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-get-started-linux>
- Mac: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-get-started-mac>
- Windows: <https://docs.microsoft.com/en-us/azure/service-fabric/service-fabric-get-started>

Area	Package	Version	Repository	Direct Download Link
<b>Service Fabric Runtime</b>	Ubuntu Developer Set-up	6.5.435.1	N/A	Cluster Runtime: <a href="https://apt.mo.trafficmanager.net/repos/servicefabric/pool/main/s/servicefabric">https://apt-mo.trafficmanager.net/repos/servicefabric/pool/main/s/servicefabric</a>  Service Fabric SDK for local cluster setup: <a href="https://apt.mo.trafficmanager.net/repos/servicefabric/pool/main/s/servicefabriccommon/">https://apt-mo.trafficmanager.net/repos/servicefabric/pool/main/s/servicefabriccommon/</a>  Container image: <a href="https://hub.docker.com/r/microsoft/service-fabric-onebox/">https://hub.docker.com/r/microsoft/service-fabric-onebox/</a>
<b>Service Fabric Runtime</b>	Windows Developer Set-up	6.5.639.9590	N/A	<a href="https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftServiceFabric.6.5.639.9590.exe">https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftServiceFabric.6.5.639.9590.exe</a>
<b>Service Fabric for Windows Server</b>	Service Fabric Standalone Installer Package	6.5.639.9590	N/A	<a href="https://download.microsoft.com/download/8/3/6/836E3E99-A300-4714-8278-96BC3E8B5528/6.5.639.9590/Microsoft.Azure.ServiceFabric.WindowsServer.6.5.639.9590.zip">https://download.microsoft.com/download/8/3/6/836E3E99-A300-4714-8278-96BC3E8B5528/6.5.639.9590/Microsoft.Azure.ServiceFabric.WindowsServer.6.5.639.9590.zip</a>

Area	Package	Version	Repository	Direct Download Link
<b>Service Fabric for Windows Server</b>	Service Fabric Standalone Runtime	6.5.639.9590	N/A	<a href="https://download.microsoft.com/download/B/0/B/B0BCCAC5-65AA-4BE3-AB13-D5FF5890F4B5/6.5.639.9590/MicrosoftAzureServiceFabric.6.5.639.9590.cab">https://download.microsoft.com/download/B/0/B/B0BCCAC5-65AA-4BE3-AB13-D5FF5890F4B5/6.5.639.9590/MicrosoftAzureServiceFabric.6.5.639.9590.cab</a>
<b>.NET SDK</b>	Windows .NET SDK	3.4.639	N/A	<a href="https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftServiceFabricSDK.3.4.639.msi">https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftServiceFabricSDK.3.4.639.msi</a>
<b>.NET SDK</b>	Microsoft.ServiceFabric	6.5.639	N/A	<a href="https://www.nuget.org">https://www.nuget.org</a>
<b>.NET SDK</b>	Reliable Services and Reliable Actors <ul style="list-style-type: none"> <li>• Microsoft.ServiceFabric.Services</li> <li>• Microsoft.ServiceFabric.Services.Remoting</li> <li>• Microsoft.ServiceFabric.Services.Wcf</li> <li>• Microsoft.ServiceFabric.Actors</li> <li>• Microsoft.ServiceFabric.Actors.Wcf</li> </ul>	3.4.639	<a href="https://github.com/Azure/service-fabric-services-and-actors-dotnet">https://github.com/Azure/service-fabric-services-and-actors-dotnet</a>	<a href="https://www.nuget.org">https://www.nuget.org</a>
<b>.NET SDK</b>	ASP.NET Core Service Fabric integration <ul style="list-style-type: none"> <li>• Microsoft.ServiceFabric.Services.AspNetCore.*</li> </ul>	3.4.639	<a href="https://github.com/Azure/service-fabric-aspnetcore">https://github.com/Azure/service-fabric-aspnetcore</a>	<a href="https://www.nuget.org">https://www.nuget.org</a>

Area	Package	Version	Repository	Direct Download Link
<b>.NET SDK</b>	Data, Diagnostics and Fabric transport <ul style="list-style-type: none"> <li>• Microsoft.ServiceFabric.Data</li> <li>• Microsoft.ServiceFabric.Data.Interfaces</li> <li>• Microsoft.ServiceFabric.Diagnostics.Internal</li> </ul> Microsoft.ServiceFabric.FabricTransport.Internal	3.4.639	N/A	<a href="https://www.nuget.org">https://www.nuget.org</a>
<b>.NET SDK</b>	Microsoft.ServiceFabric.Data.Extensions	1.4.639	N/A	<a href="https://www.nuget.org">https://www.nuget.org</a>
<b>Java SDK</b>	Java SDK	1.0.5	N/A	<a href="https://mvnrepository.com/artifact/com.microsoft.servicefabric/sf-actors/1.0.5">https://mvnrepository.com/artifact/com.microsoft.servicefabric/sf-actors/1.0.5</a>
<b>Visual Studio</b>	Visual Studio 2017 Tools for Service Fabric	2.4.11024.1	N/A	Included in Visual Studio 2017 Update 7 (15.7) and above
	Visual Studio 2015 Tools for Service Fabric	2.4.11116.1	N/A	See localized download links below
<b>Eclipse</b>	Service Fabric plug-in for Eclipse	2.0.7	N/A	N/A
<b>Yeoman</b>	Azure Service Fabric Java generator	1.0.7	<a href="https://github.com/Azure/generator-azuresfjava">https://github.com/Azure/generator-azuresfjava</a>	N/A
<b>Yeoman</b>	Azure Service Fabric C# generator	1.0.9	<a href="https://github.com/Azure/generator-azuresfcsharp">https://github.com/Azure/generator-azuresfcsharp</a>	N/A
<b>Yeoman</b>	Azure Service Fabric guest executables generator	1.0.1	<a href="https://github.com/Azure/generator-azuresfguest">https://github.com/Azure/generator-azuresfguest</a>	N/A
<b>Yeoman</b>	Azure Service Fabric Container generators	1.0.1	<a href="https://github.com/Azure/generator-azuresfcontainer">https://github.com/Azure/generator-azuresfcontainer</a>	N/A
<b>CLI</b>	Service Fabric CLI	8.0.0	<a href="https://github.com/Azure/service-fabric-cli">https://github.com/Azure/service-fabric-cli</a>	<a href="https://pypi.python.org/pypi/sfctl">https://pypi.python.org/pypi/sfctl</a>
<b>PowerShell</b>	AzureRM.ServiceFabric	0.3.15	<a href="https://github.com/Azure/azure-powershell/tree/preview/src/ResourceManager/ServiceFabric">https://github.com/Azure/azure-powershell/tree/preview/src/ResourceManager/ServiceFabric</a>	<a href="https://www.powershellgallery.com/packages/AzureRM.ServiceFabric/0.3.15">https://www.powershellgallery.com/packages/AzureRM.ServiceFabric/0.3.15</a>

## Visual Studio 2015 Tool for Service Fabric – localized download links

**NOTE:** The below download links are for the 2.4.11116.1 release of Visual Studio 2015 Tools for Service Fabric.

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.de-de.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.en-us.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.es-es.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.fr-fr.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.it-it.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.ja-jp.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.ko-kr.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.ru-ru.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.zh-cn.msi>

<https://download.microsoft.com/download/C/7/B/C7B7BA41-B95A-4363-8B28-7075E9B10E99/MicrosoftAzureServiceFabricTools.VS140.zh-tw.msi>