



# Network port reference

StorageGRID 11.5

NetApp  
October 22, 2024

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# Network port reference

You must ensure the network infrastructure can provide internal and external communication between nodes within the grid and to external clients and services. You might need access across internal and external firewalls, switching systems, and routing systems.

Use the details provided for internal grid node communications and external communications to determine how to configure each required port.

- [Internal grid node communications](#)
- [External communications](#)

## Internal grid node communications

The StorageGRID internal firewall only allows incoming connections to specific ports on the Grid Network, with the exception of ports 22, 80, 123, and 443 (see the information about external communications). Connections are also accepted on ports defined by load balancer endpoints.



NetApp recommends that you enable Internet Control Message Protocol (ICMP) traffic between grid nodes. Allowing ICMP traffic can improve failover performance when a grid node cannot be reached.

In addition to ICMP and the ports listed in the table, StorageGRID uses the Virtual Router Redundancy Protocol (VRRP). VRRP is an internet protocol that uses IP protocol number 112. StorageGRID uses VRRP in unicast mode only. VRRP is required only if high availability (HA) groups are configured.

### Guidelines for Linux-based nodes

If enterprise networking policies restrict access to any of these ports, you can remap ports at deployment time using a deployment configuration parameter. For more information about port remapping and deployment configuration parameters, see the installation instructions for your Linux platform.

### Guidelines for VMware-based nodes

Configure the following ports only if you need to define firewall restrictions that are external to VMware networking.

If enterprise networking policies restrict access to any of these ports, you can remap ports when you deploy nodes using the VMware vSphere Web Client, or by using a configuration file setting when automating grid node deployment. For more information about port remapping and deployment configuration parameters, see the installation instructions for VMware.

### Guidelines for appliance Storage Nodes

If enterprise networking policies restrict access to any of these ports, you can remap ports using the StorageGRID Appliance Installer. For more information about port remapping for appliances, see the installation instructions for your storage appliance.

## StorageGRID internal ports

| Port | TCP or UDP | From               | To                     | Details                                                                                                                                                                      |
|------|------------|--------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22   | TCP        | Primary Admin Node | All nodes              | For maintenance procedures, the primary Admin Node must be able to communicate with all other nodes using SSH on port 22. Allowing SSH traffic from other nodes is optional. |
| 80   | TCP        | Appliances         | Primary Admin Node     | Used by StorageGRID appliances to communicate with the primary Admin Node to start the installation.                                                                         |
| 123  | UDP        | All nodes          | All nodes              | Network time protocol service. Every node synchronizes its time with every other node using NTP.                                                                             |
| 443  | TCP        | All nodes          | Primary Admin Node     | Used for communicating status to the primary Admin Node during installation and other maintenance procedures.                                                                |
| 1139 | TCP        | Storage Nodes      | Storage Nodes          | Internal traffic between Storage Nodes.                                                                                                                                      |
| 1501 | TCP        | All nodes          | Storage Nodes with ADC | Reporting, auditing, and configuration internal traffic.                                                                                                                     |
| 1502 | TCP        | All nodes          | Storage Nodes          | S3- and Swift-related internal traffic.                                                                                                                                      |

|      |     |               |                    |                                                                                                                             |
|------|-----|---------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 1504 | TCP | All nodes     | Admin Nodes        | NMS service reporting and configuration internal traffic.                                                                   |
| 1505 | TCP | All nodes     | Admin Nodes        | AMS service internal traffic.                                                                                               |
| 1506 | TCP | All nodes     | All nodes          | Server status internal traffic.                                                                                             |
| 1507 | TCP | All nodes     | Gateway Nodes      | Load balancer internal traffic.                                                                                             |
| 1508 | TCP | All nodes     | Primary Admin Node | Configuration management internal traffic.                                                                                  |
| 1509 | TCP | All nodes     | Archive Nodes      | Archive Node internal traffic.                                                                                              |
| 1511 | TCP | All nodes     | Storage Nodes      | Metadata internal traffic.                                                                                                  |
| 5353 | UDP | All nodes     | All nodes          | Optionally used for full-grid IP changes and for primary Admin Node discovery during installation, expansion, and recovery. |
| 7001 | TCP | Storage Nodes | Storage Nodes      | Cassandra TLS inter-node cluster communication.                                                                             |
| 7443 | TCP | All Nodes     | Admin Nodes        | Internal traffic for maintenance procedures and error reporting.                                                            |
| 9042 | TCP | Storage Nodes | Storage Nodes      | Cassandra client port.                                                                                                      |

|       |     |                       |                        |                                                                                                                                       |
|-------|-----|-----------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 9999  | TCP | All nodes             | All nodes              | Internal traffic for multiple services. Includes maintenance procedures, metrics, and networking updates.                             |
| 10226 | TCP | Storage Nodes         | Primary Admin Node     | Used by StorageGRID appliances for forwarding AutoSupport messages from E-Series SANtricity System Manager to the primary Admin Node. |
| 11139 | TCP | Archive/Storage Nodes | Archive/Storage Nodes  | Internal traffic between Storage Nodes and Archive Nodes.                                                                             |
| 18000 | TCP | Admin/Storage Nodes   | Storage Nodes with ADC | Account service internal traffic.                                                                                                     |
| 18001 | TCP | Admin/Storage Nodes   | Storage Nodes with ADC | Identity Federation internal traffic.                                                                                                 |
| 18002 | TCP | Admin/Storage Nodes   | Storage Nodes          | Internal API traffic related to object protocols.                                                                                     |
| 18003 | TCP | Admin/Storage Nodes   | Storage Nodes with ADC | Platform services internal traffic.                                                                                                   |
| 18017 | TCP | Admin/Storage Nodes   | Storage Nodes          | Data Mover service internal traffic for Cloud Storage Pools.                                                                          |
| 18019 | TCP | Storage Nodes         | Storage Nodes          | Chunk service internal traffic for erasure coding.                                                                                    |
| 18082 | TCP | Admin/Storage Nodes   | Storage Nodes          | S3-related internal traffic.                                                                                                          |

|       |     |                     |                        |                                              |
|-------|-----|---------------------|------------------------|----------------------------------------------|
| 18083 | TCP | All nodes           | Storage Nodes          | Swift-related internal traffic.              |
| 18200 | TCP | Admin/Storage Nodes | Storage Nodes          | Additional statistics about client requests. |
| 19000 | TCP | Admin/Storage Nodes | Storage Nodes with ADC | Keystone service internal traffic.           |

## Related information

[External communications](#)

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## External communications

Clients need to communicate with grid nodes to ingest and retrieve content. The ports used depends on the object storage protocols chosen. These ports need to be accessible to the client.

If enterprise networking policies restrict access to any of the ports, you can use load balancer endpoints to allow access on user-defined ports. The untrusted Client Networks feature can be used to allow access only on load balancer endpoint ports.



To use systems and protocols such as SMTP, DNS, SSH, or DHCP, you must remap ports when deploying nodes. However, you should not remap balancer endpoints. For information about port remapping, see the installation instructions for your platform.

The following table shows the ports used for traffic into the nodes.



This list does not include ports that might be configured as load balancer endpoints. For more information, see the instructions for configuring load balancer endpoints.

| Port | TCP or UDP | Protocol | From                   | To           | Details                                                                                                                                                                       |
|------|------------|----------|------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22   | TCP        | SSH      | Service laptop         | All nodes    | SSH or console access is required for procedures with console steps. Optionally, you can use port 2022 instead of 22.                                                         |
| 25   | TCP        | SMTP     | Admin Nodes            | Email server | Used for alerts and email-based AutoSupport. You can override the default port setting of 25 using the Email Servers page.                                                    |
| 53   | TCP/ UDP   | DNS      | All nodes              | DNS servers  | Used for domain name system.                                                                                                                                                  |
| 67   | UDP        | DHCP     | All nodes              | DHCP service | Optionally used to support DHCP-based network configuration. The dhclient service does not run for statically-configured grids.                                               |
| 68   | UDP        | DHCP     | DHCP service           | All nodes    | Optionally used to support DHCP-based network configuration. The dhclient service does not run for grids that use static IP addresses.                                        |
| 80   | TCP        | HTTP     | Browser                | Admin Nodes  | Port 80 redirects to port 443 for the Admin Node user interface.                                                                                                              |
| 80   | TCP        | HTTP     | Browser                | Appliances   | Port 80 redirects to port 8443 for the StorageGRID Appliance Installer.                                                                                                       |
| 80   | TCP        | HTTP     | Storage Nodes with ADC | AWS          | Used for platform services messages sent to AWS or other external services that use HTTP. Tenants can override the default HTTP port setting of 80 when creating an endpoint. |



| Port | TCP or UDP | Protocol | From              | To           | Details                                                                                                                                                                     |
|------|------------|----------|-------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 80   | TCP        | HTTP     | Storage Nodes     | AWS          | Cloud Storage Pools requests sent to AWS targets that use HTTP. Grid administrators can override the default HTTP port setting of 80 when configuring a Cloud Storage Pool. |
| 111  | TCP/ UDP   | RPCBind  | NFS client        | Admin Nodes  | Used by NFS-based audit export (portmap).<br><br><b>Note:</b> This port is required only if NFS-based audit export is enabled.                                              |
| 123  | UDP        | NTP      | Primary NTP nodes | External NTP | Network time protocol service. Nodes selected as primary NTP sources also synchronize clock times with the external NTP time sources.                                       |
| 137  | UDP        | NetBIOS  | SMB client        | Admin Nodes  | Used by SMB-based audit export for clients that require NetBIOS support.<br><br><b>Note:</b> This port is required only if SMB-based audit export is enabled.               |
| 138  | UDP        | NetBIOS  | SMB client        | Admin Nodes  | Used by SMB-based audit export for clients that require NetBIOS support.<br><br><b>Note:</b> This port is required only if SMB-based audit export is enabled.               |
| 139  | TCP        | SMB      | SMB client        | Admin Nodes  | Used by SMB-based audit export for clients that require NetBIOS support.<br><br><b>Note:</b> This port is required only if SMB-based audit export is enabled.               |

| Port | TCP or UDP | Protocol           | From                   | To                        | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------|------------|--------------------|------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 161  | TCP/ UDP   | SNMP               | SNMP client            | All nodes                 | <p>Used for SNMP polling. All nodes provide basic information; Admin Nodes also provide alert and alarm data. Defaults to UDP port 161 when configured.</p> <p><b>Note:</b> This port is only required, and is only opened on the node firewall if SNMP is configured. If you plan to use SNMP, you can configure alternate ports.</p> <p><b>Note:</b> For information about using SNMP with StorageGRID, contact your NetApp account representative.</p> |
| 162  | TCP/ UDP   | SNMP Notifications | All nodes              | Notification destinations | <p>Outbound SNMP notifications and traps default to UDP port 162.</p> <p><b>Note:</b> This port is only required if SNMP is enabled and notification destinations are configured. If you plan to use SNMP, you can configure alternate ports.</p> <p><b>Note:</b> For information about using SNMP with StorageGRID, contact your NetApp account representative.</p>                                                                                      |
| 389  | TCP/ UDP   | LDAP               | Storage Nodes with ADC | Active Directory/LDAP     | Used for connecting to an Active Directory or LDAP server for Identity Federation.                                                                                                                                                                                                                                                                                                                                                                        |
| 443  | TCP        | HTTPS              | Browser                | Admin Nodes               | Used by web browsers and management API clients for accessing the Grid Manager and Tenant Manager.                                                                                                                                                                                                                                                                                                                                                        |
| 443  | TCP        | HTTPS              | Admin Nodes            | Active Directory          | Used by Admin Nodes connecting to Active Directory if single sign-on (SSO) is enabled.                                                                                                                                                                                                                                                                                                                                                                    |

| Port | TCP or UDP | Protocol | From                   | To          | Details                                                                                                                                                                         |
|------|------------|----------|------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 443  | TCP        | HTTPS    | Archive Nodes          | Amazon S3   | Used for accessing Amazon S3 from Archive Nodes.                                                                                                                                |
| 443  | TCP        | HTTPS    | Storage Nodes with ADC | AWS         | Used for platform services messages sent to AWS or other external services that use HTTPS. Tenants can override the default HTTP port setting of 443 when creating an endpoint. |
| 443  | TCP        | HTTPS    | Storage Nodes          | AWS         | Cloud Storage Pools requests sent to AWS targets that use HTTPS. Grid administrators can override the default HTTPS port setting of 443 when configuring a Cloud Storage Pool.  |
| 445  | TCP        | SMB      | SMB client             | Admin Nodes | Used by SMB-based audit export.<br><br><b>Note:</b> This port is required only if SMB-based audit export is enabled.                                                            |
| 903  | TCP        | NFS      | NFS client             | Admin Nodes | Used by NFS-based audit export ( <code>rpc.mountd</code> ).<br><br><b>Note:</b> This port is required only if NFS-based audit export is enabled.                                |
| 2022 | TCP        | SSH      | Service laptop         | All nodes   | SSH or console access is required for procedures with console steps. Optionally, you can use port 22 instead of 2022.                                                           |
| 2049 | TCP        | NFS      | NFS client             | Admin Nodes | Used by NFS-based audit export ( <code>nfs</code> ).<br><br><b>Note:</b> This port is required only if NFS-based audit export is enabled.                                       |

| Port | TCP or UDP | Protocol | From           | To            | Details                                                                                                                                                                                                                                                                            |
|------|------------|----------|----------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5696 | TCP        | KMIP     | Appliance      | KMS           | Key Management Interoperability Protocol (KMIP) external traffic from appliances configured for node encryption to the Key Management Server (KMS), unless a different port is specified on the KMS configuration page of the StorageGRID Appliance Installer.                     |
| 8022 | TCP        | SSH      | Service laptop | All nodes     | SSH on port 8022 grants access to the base operating system on appliance and virtual node platforms for support and troubleshooting. This port is not used for Linux-based (bare metal) nodes and is not required to be accessible between grid nodes or during normal operations. |
| 8082 | TCP        | HTTPS    | S3 clients     | Gateway Nodes | S3-related external traffic to Gateway Nodes (HTTPS).                                                                                                                                                                                                                              |
| 8083 | TCP        | HTTPS    | Swift clients  | Gateway Nodes | Swift-related external traffic to Gateway Nodes (HTTPS).                                                                                                                                                                                                                           |
| 8084 | TCP        | HTTP     | S3 clients     | Gateway Nodes | S3-related external traffic to Gateway Nodes (HTTP).                                                                                                                                                                                                                               |
| 8085 | TCP        | HTTP     | Swift clients  | Gateway Nodes | Swift-related external traffic to Gateway Nodes (HTTP).                                                                                                                                                                                                                            |
| 8443 | TCP        | HTTPS    | Browser        | Admin Nodes   | Optional. Used by web browsers and management API clients for accessing the Grid Manager. Can be used to separate Grid Manager and Tenant Manager communications.                                                                                                                  |

| Port  | TCP or UDP | Protocol | From                     | To            | Details                                                                                                                                                                                       |
|-------|------------|----------|--------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9022  | TCP        | SSH      | Service laptop           | Appliances    | Grants access to StorageGRID appliances in pre-configuration mode for support and troubleshooting. This port is not required to be accessible between grid nodes or during normal operations. |
| 9091  | TCP        | HTTPS    | External Grafana service | Admin Nodes   | Used by external Grafana services for secure access to the StorageGRID Prometheus service.<br><br><b>Note:</b> This port is required only if certificate-based Prometheus access is enabled.  |
| 9443  | TCP        | HTTPS    | Browser                  | Admin Nodes   | Optional. Used by web browsers and management API clients for accessing the Tenant Manager. Can be used to separate Grid Manager and Tenant Manager communications.                           |
| 18082 | TCP        | HTTPS    | S3 clients               | Storage Nodes | S3-related external traffic to Storage Nodes (HTTPS).                                                                                                                                         |
| 18083 | TCP        | HTTPS    | Swift clients            | Storage Nodes | Swift-related external traffic to Storage Nodes (HTTPS).                                                                                                                                      |
| 18084 | TCP        | HTTP     | S3 clients               | Storage Nodes | S3-related external traffic to Storage Nodes (HTTP).                                                                                                                                          |
| 18085 | TCP        | HTTP     | Swift clients            | Storage Nodes | Swift-related external traffic to Storage Nodes (HTTP).                                                                                                                                       |

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