



NAT and Firewall ALG Support on Cisco ASR 1000 Series Aggregation Services Routers

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The following tables summarize Network Address Translation (NAT) and Firewall Application Layer Gateway (ALG) feature support on Cisco ASR 1000 Series Aggregation Services Routers in Cisco IOS XE Release 2.1.0 and later releases. Each table lists the features whose support was introduced in the release. NAT and Firewall ALG support is cumulative; features supported in earlier releases continue to be supported in later releases.

This document contains the following tables:

- NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.14.0
- NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.13.0
- NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.11.0
- NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.9.0
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NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.14.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.14.0:

Table 1. NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.14.0

Application Layer Gateway/Inspection	Features Supported
MSRPC ALG VTCP Support	<ul style="list-style-type: none"> ■ Segmented TCP-based message

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.13.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.13.0:

Table 2. NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.13.0

Application Layer Gateway/Inspection	Features Supported
MSRPC ALG VTCP Support	<ul style="list-style-type: none"> ■ Packet Tracing Support ■ Conditional Debugging ■ Debug Log/Trace file severity cleanup

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.11.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.11.0:

Table 3. NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.11.0

Application Layer Gateway/Inspection	Features Supported
SIP ALG resilience to Dos attack	<ul style="list-style-type: none"> ■ Configurable lock limit ■ Dynamic black list ■ Configurable timers

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.9.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.9.0:

Table 4. NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.9.0

Application Layer Gateway/Inspection	Features Supported
GTPv2	<ul style="list-style-type: none"> ■ Support GTPv2 inspection (3GPP RLS8 / RLS9)

Application Layer Gateway/Inspection	Features Supported
Serviceability	<ul style="list-style-type: none"> ■ ALG/AIC Serviceability improvement
PPTP	<ul style="list-style-type: none"> ■ PPTP ALG support

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.8.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.8.0:

Table 5. NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.8.0

Application Layer Gateway/Inspection	Features Supported
GTP AIC	<ul style="list-style-type: none"> ■ Support 3GPP RLS 7&8 for GTPv1

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.7.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.7.0:

Table 6. NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.7.0

Application Layer Gateway/Inspection	Features Supported
GTP AIC	<ul style="list-style-type: none"> ■ Support GGSN polling feature for GTPv0/GTPv1

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.6.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.6.0:

Table 7. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.6.0

Application Layer Gateway	Features Supported
H323	<ul style="list-style-type: none"> ■ Support H323 version 6 with H.225 v6 and H.245 v13
FTP64	<ul style="list-style-type: none"> ■ Support IPv4-embedded IPv6 address

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.5.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.5.0:

Table 8. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.5.0

Application Layer Gateway	Features Supported
SIP	<ul style="list-style-type: none"> ■ Multiple SIP messages per TCP segment. ■ No High Availability is supported for SIP ALG
SCCP	<ul style="list-style-type: none"> ■ Support SCCP Version 17 to interwork with Cisco Unified Communications Manager (CUCM) 8.x. ■ No High Availability is supported for SCCP ALG.
MS-RPC	<ul style="list-style-type: none"> ■ Not a public protocol and vastly based on DCE RPC protocol which can be review at http://pubs.opengroup.org/online_pubs/9629399/ ■ Support NAT and FW ■ No TCP segmentation (vTCP) support at this release ■ TCP only <p>The following information is available on Cisco.om:</p> <ul style="list-style-type: none"> ■ FW L7 policy inspection of TCP communication between the EPM (Endpoint Mapper) on the Server side to the Client on the well-known TCP port 135. ■ A client will call the endpoint mapper at the server to ask for a "well known" service. The server will answer the client at which addresses this service is available (or if this service is not available at all). ■ Apply NAT if needed and rewrite the message. ■ Allow multiple use of the imprecise FW session, since a client may attempt multiple connections to the server port returned by the EPM.
MS-RPC (contd ...)	<ul style="list-style-type: none"> ■ A FW session is based on five tuples: source/destination IP addresses source/destination ports and protocol. When the source port is unknown, an imprecise FW session will be created. When traffic "hits" the other four tuples, a FW session will be created. ■ Provide validity of the MSRPC protocol (messages and protocol): binding – bind request and response tracking; call , request and response message tracking ■ No TCP segmentation (vTCP) support at this release
FTP64	<ul style="list-style-type: none"> ■ Intra-Chassis High Availability Support

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.4.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.4.0:

Table 9. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.4.0

Application Layer Gateway	Features Supported
FTP64	<ul style="list-style-type: none"> ■ Support draft-ietf-behave-ftp64-06 ■ Support Stateful NAT64 only; Stateless NAT64 is not supported ■ Support VFR/IP Reassembly ■ No High Availability and VRF support ■ No Firewall support ■ No IPv4-embedded IPv6 address support

Table 20. Firewall AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.4.0

Application Layer Gateway	Features Supported
GTP v0, v1	<ul style="list-style-type: none"> ■ FW L7 policy inspection ■ Verify protocol integrity ■ Support GTPv0 and GTPv1 control packets inspection (APN regular expression, MCC/MNC, packet type, length). ■ Data packets are not inspected. ■ Provides partial parity to ASA functionality

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.2.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.2.0:

Table 11. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.2.0

Application Layer Gateway	Features Supported
SIP Enhancement	<ul style="list-style-type: none"> ■ Support TCP segmentation (vTCP) under NAT and/or FW configuration ■ Support SIP Trunk ■ Support REFER Method ■ Support Multiple M-lines in SDP (up to 5 m-lines)

Application Layer Gateway	Features Supported
SunRPC	<ul style="list-style-type: none"> ■ Support TCP segmentation (vTCP) under NAT and/or FW configuration ■ Support SIP Trunk ■ Support NAT and FW ■ Portmapper version 2 will be inspected while version 3 & 4 will be passed through <p>The following is not supported:</p> <ul style="list-style-type: none"> ■ TCP segmentation

Table 12. Firewall AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.2.0

Application Layer Gateway	Features Supported
SMTP	<ul style="list-style-type: none"> ■ FW L7 policy inspection ■ Support SMTP and ESMTP, only regular extensions ■ Data inspection
POP3	<ul style="list-style-type: none"> ■ FW L7 policy inspection ■ Inspection of session establishment only ■ Encrypted packets are passed through
IMAP	<ul style="list-style-type: none"> ■ FW L7 policy inspection ■ Inspection of session establishment only ■ Encrypted packets are passed through
SunRPC	<ul style="list-style-type: none"> ■ L7 policy inspection based on sunrpc program number

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.1.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 3.1.0:

Table 33. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 3.1.0

Application Layer Gateway	Features Supported
RTSP Enhancement	<ul style="list-style-type: none"> ■ Support NAT (in RTP, RDT and Interleave mode) ■ Support TCP segmentation under NAT and/or FW configuration
DNS Enhancement	<ul style="list-style-type: none"> ■ Support TCP segmentation under NAT and/or FW configuration <p>Note: FW-only configuration won't support reassemble</p>

Application Layer Gateway	Features Supported
RCMD	<ul style="list-style-type: none"> ■ Support NAT and FW ■ Support rlogin, rsh and rexec ■ TCP-only ■ Support VRF ■ External authentication mechanisms on behaves of peers involved
NETBIOS	<ul style="list-style-type: none"> ■ Support RFC 1002 under NAT and Firewall configurations ■ Support Netbios over IP only ■ Support the following services: <ul style="list-style-type: none"> ■ Naming Service ■ Session Service ■ Datagram Service ■ Support protocol conformance under NAT and FW ■ Support VRF <p>The following are not supported:</p> <ul style="list-style-type: none"> ■ Enforcing user authentication via Active Directory and LDAP to access NetBIOS Name Service. ■ Server Message Block Protocol (SMB) messages under NetBIOS Session Service. These messages have TCP port 445. ■ TCP segmentation
All ALG	<ul style="list-style-type: none"> ■ HA Break – HA activities from previous releases will be unpredictable.

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.5.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 2.5.0:

Table 44. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.5.0

Application Layer Gateway	Features Supported
FTP, TFTP, DNS, LDAP, SIP, H323, SCCP, RTSP	<ul style="list-style-type: none"> ■ VRF Support

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.4.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 2.4.0:

Table 55. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.4.0

Application Layer Gateway	Features Supported
H.323 RAS	<ul style="list-style-type: none"> ■ All Gatekeeper-related messages are supported. <p>The following features are not supported:</p> <ul style="list-style-type: none"> ■ Discovering Gatekeeper network element using multicast mechanism ■ Discovering Gatekeeper network element using FQDN ■ Discovering Gatekeeper network element using URL ■ TCP segmentation
LDAP	<ul style="list-style-type: none"> ■ Support NAT only (not applicable to Firewall.) ■ Support LDAP version 2 and version 3 messages. <p>NAT fixup will be done on the following LDAP messages:</p> <ul style="list-style-type: none"> ■ ADDREQUEST ■ SEARCHREQUEST ■ SEARCHRESPONSE
SIP Extension	<ul style="list-style-type: none"> ■ Support RFC 2976 – INFO. ■ Support RFC 3262 – PRACK. ■ Support RFC 3265 - SUBSCRIBE/NOTIFY. ■ Support RFC 3311 – UPDATE. ■ Support RFC 3428 – MESSAGE. ■ Support RFC 3515, 3892 – REFER. ■ Support SIP over TCP. ■ TCP segmentation is not supported. ■ FQDN is not supported.

Application Layer Gateway	Features Supported
Skinny Video	<ul style="list-style-type: none">■ Support IP phones with video capability. <p>The following two new messages are supported for NAT and Firewall:</p> <ul style="list-style-type: none">■ OpenMultiMediaReceiveChannelAck■ StartMultiMediaTransmission■ Support Cisco Unified Communications Manager (through Release 6.1.) and SCCPv8 (or any compatible version)■ TCP segmentation is not supported.

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.2.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 2.2.0:

Table 66. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.2.0

Application Layer Gateway	Features Supported
RTSP	<p>RFC 2326, Real Time Streaming Protocol (RTSP) as follows:</p> <ul style="list-style-type: none"> ■ TCP only. ■ No content-type will be examined by RTSP ALG. ■ No fully qualified domain name (FQDN) support. ■ Support Firewall only. <p>Support RTSP as a pass-thru protocol as follows:</p> <ul style="list-style-type: none"> ■ No RTSP request/response sources/terminates on the platform. ■ No RTSP configuration. ■ No RTSP-specific statistics will be sent. ■ No multicast support.

NAT and Firewall ALG/AIC Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.1.0

The following table summarizes NAT and Firewall ALG/AIC support on Cisco ASR 1000 Series Routers that was introduced in Cisco IOS XE Release 2.1.0:

Table 7. NAT and Firewall ALG Support on Cisco ASR 1000 Series Routers in Cisco IOS XE Release 2.1.0

Application Layer Gateway	Features Supported
Domain Name System (DNS)	<p>Support RFC 1035, both TCP and UDP, for NAT and Firewall. DNS ALG will parse all DNS packets, including the following:</p> <ul style="list-style-type: none"> ■ TYPE_A query/response ■ TYPE_CNAME ■ TYPE_MX ■ TYPE_NS ■ TYPE_PTR query/response ■ TYPE_SOA
File Transfer Protocol (FTP)	<p>Support RFC765 for NAT and Firewall. Supported modes include the following:</p> <ul style="list-style-type: none"> ■ Active mode ■ Passive mode
H.323	<ul style="list-style-type: none"> ■ H.323v4 with H.225v4 and H.245v7. Support for GW-Terminal is available. Gatekeeper-related messages will be ignored. ■ Backward compatibility support only until H.323v2. H.323v1 messages will be ignored. ■ FastConnect and Tunneling are supported. (Tunneling specifically refers to sending H.245 messages within H.225.0 messages.) ■ Support both NAT and Firewall. ■ H.323 RAS is not supported. ■ Multipoint is not supported. ■ T.120 is not supported.

Application Layer Gateway	Features Supported
<p>Internet Control Message Protocol (ICMP)</p>	<p>Supported ICMP types for Firewall include the following:</p> <ul style="list-style-type: none"> ■ ECHO ■ ECHO REPLY ■ TIME EXCEEDED ■ TIMESTAMP ■ TIMESTAMP REPLY ■ UNREACHABLE <p>Supported ICMP types for NAT include the following:</p> <ul style="list-style-type: none"> ■ ECHO ■ ECHO REPLY ■ SOURCE QUENCH ■ TIME EXCEEDED ■ TIMESTAMP ■ TIMESTAMP REPLY ■ UNREACHABLE
<p>Session Initiation Protocol (SIP)</p>	<p>Support RFC3261 for NAT and Firewall. Supported methods include the following:</p> <ul style="list-style-type: none"> ■ ACK ■ BYE ■ CANCEL ■ INVITE ■ OPTIONS ■ REGISTER ■ RE-INVITE <p>■ Only User Datagram Protocol (UDP) SIP is supported; Transmission Control Protocol (TCP) SIP is not supported.</p>

Application Layer Gateway	Features Supported
Skinny Call Control Protocol (SCCP)	<ul style="list-style-type: none"> ■ Supported messages for NAT and Firewall include the following: ■ CloseReceiveChannel ■ OpenReceiveChannelAck ■ Register ack ■ Register message ■ Register reject ■ StartMediaTransmission ■ StopMediaTransmission ■ Support Cisco Unified Communications Manager (through Release 6.1.) and SCCPv8 (or any compatible version)
Trivial File Transfer Protocol (TFTP)	<ul style="list-style-type: none"> ■ Support for NAT and Firewall. ■ Support opcode RRQ (read request) and WRQ (write request) in RFC-1350.

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