



AMF Logging

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

| | |
|--|---------------------|
| Applicable Product(s) or Functional Area | AMF |
| Applicable Platform(s) | SMI |
| Feature Default Setting | Enabled - Always-on |
| Related Documentation | Not Applicable |

Revision History

Table 2: Revision History

| Revision Details | Release |
|-------------------|-----------|
| First introduced. | 2021.04.0 |

Feature Description

AMF utilizes the common logging framework to generate logs from its microservices.

The supported log levels are:

- Error

- Warn
- Info
- Debug
- Trace



Note Warn level logging takes place during production.

Error

These errors are fatal errors, which can impact service for multiple subscribers.

Examples of the error messages:

- Node discovery of SBA fails after query from NRF and local configuration
- Mandatory IE missing in an NGAP message
- Memory cache startup errors
- Endpoint not found

Sample log:

```
[ERROR] [ApplicationContext.go:1820] [infra.dpd.core] Ping Unsuccessful for client Id 4
Name: amf-protocol-ep0 Setname: amf-protocol-ep Host: amf-protocol-ep Port: 9003 Url: for
[246]
```

Warn

These errors impact few specific call-flows majorly, but not blockers of functionality.

Example of the warning messages:

- Node discovery of SBA fails but we have more options to retry.
- Mandatory IE missing in a NAS message
- RPC timeout
- Procedural timeout
- Validation failure (not critical)

Example: Registration rejected as Registration request message received registration type as the Reserved registration type.

- External entity sending unexpected or negative response
Example: Handover Cancel, Hand over Failure, or Initial Context Setup Failure
- Unexpected value of objects maintained by AMF
Example: NIL value of transaction

- Unable to fetch a subscriber

Sample log:

```
[WARN] [amf-service.amf-app.messageprocessor] No procedure defined for message type 763
```

Info

This log level purpose is to know information for cause.

Examples of the information messages:

- Procedural outcome Example: Disabling of ICSR for Registration
- Collision abort, cleanup, suspend, or continue.

Sample log:

```
[INFO] [amf-service.amf-app.auth] Sending N12 Authentication Request to Rest EP
```

Debug

This log level purpose is to get debug messages.

Example of the debug messages:

- All external exchanged messages
- Sending Registration accept to UE
- State machine changes
- Collision detailed logging

Sample log:

```
[DEBUG] [process.go:1606] [amf-service.amf-app.reg] [supi:123456789012345]
[supi:123456789012345] [1] Preparing registration accept to UE 123456789012345
```

Trace

This log level purpose is to get content of all external tracing messages.

Example of the trace messages:

- Registration request message
- N1N2 transfer message

Sample log:

```
[TRACE] [process.go:1627] [amf-service.amf-app.reg] [supi:123456789012345]
[supi:123456789012345]
[496] Sending RegistrationAccept:&MsgNas
{N1MsgType:154,N2MsgType:0,N1Msg:&MsgNas_MsgRegistrationAccept
{MsgRegistrationAccept:&ngn_nas.PBRegistrationAccept{ExtendedProtocolDiscriminator:126,SecurityHeaderType:
&SecurityHeaderType{HeaderType:PLAIN_5G_NAS,},MessageIdentity:&MessageType{MessageType:REGISTRATION_ACCEPT,}
,VgsRegistrationResult:&VgsRegistrationResult{EmergencyRegistered:false,NssaaPerformed:false,SmsAllowed:false,
VgsRegistrationResultValue:TGPP_ACCESS,}}
```

How it Works

This section describes how this feature works.

Log Tags

Use log tags to tag the logs for specific procedures which are part of a flow or an event. Enabling of AMF logging takes place at different log levels for different log tags.

| Name | Purpose | Example Log tags |
|-------------------|------------------------------|--|
| AMF service | To capture procedures. | <ul style="list-style-type: none">• LogTagReg• LogTagPDU, and so on |
| Protocol Endpoint | To capture on the interface. | <ul style="list-style-type: none">• LogTagNas• LogTagNgap• LogTagNonUE |
| Rest Endpoint | To capture on the interface. | <ul style="list-style-type: none">• LogTagN11• LogTagN14• LogTagNRF• LogTagN11OrN14 (N1NMsgTransfer can come from N14/N11 interfaces) and so on |