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MEF Specification MEF 55.0.x Approved Draft 1

Amendment to MEF 55 - Operational Threads

July 2017

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91 *Editor Note 2: Table of Contents shows complete list after 'track changes' are disabled with*

92 *'accept all changes'*

93 1 List of Contributing Members

94 The following members of the MEF participated in the development of this document and have
95 requested to be included in this list.

96 *Editor Note 3: Table below to be populated after Letter Ballot with companies voting in CfCB*
97 *and opt-in.*

98

XYZ	abc

99 2 Abstract

100 This document is an amendment to Lifecycle Service Orchestration (LSO) Reference Architecture
101 (RA), MEF 55 [A1-1]. The changes to MEF 55 are:

- 102 - Changes to Section 3 (Terminology) and Section 10 (Operational Threads for LSO)

103 3 Additional References (This document only)

104

105 [A1-1]MEF Forum 55, Lifecycle Service Orchestration Reference Architecture and Frame-
106 work, March 2016.

107 4 Changes to Section 3 of MEF 55 – Terminology and Acronyms

108 The following entries are added to the terminology table of MEF 55.

109

Term	Definition	Source
ADAGIO (ICM:ECM)	The element Management Interface Reference Point needed to manage the network resources, including element view related management functions	This document
ALLEGRO (CUS:SOF)	The Management Interface Reference Point that allows Customer Application Coordinator supervision and control of dynamic service of the LSO service capabilities under its purview through interactions with the Service Orchestration Functionality.	This document
Business Applications (BUS)	The Service Provider functionality supporting Business Management Layer functionality	This document
BUS-partner	Business Applications in the Partner domain	This document

Term	Definition	Source
BUS-sp	Business Applications in the Service Provider domain	This document
CANTATA (CUS:BUS)	The Management Interface Reference Point that provides a Customer Application Coordinator (including enterprise Customers) with capabilities to support the operations interactions with the Service Provider's Business Applications for a portion of the Service Provider service capabilities related to the Customer's Products and Services.	This document
Customer Application Coordinator (CUS)	A functional management entity in the Customer domain that is responsible for coordinating the management of the various service needs (e.g., compute, storage, network, etc.) of specific applications.	This document
Element Control and Management (ECM)	The set of functionality supporting element management layer capabilities for individual network elements.	This document
Infrastructure Control and Management (ICM)	The set of functionality providing domain specific network and topology view resource management capabilities including configuration, control and supervision of the network infrastructure.	This document
INTERLUDE (SOF:SOF)	The Management Interface Reference Point that provides for the coordination of a portion of LSO services within the partner domain that are managed by a Service Provider's Service Orchestration Functionality within the bounds and policies defined for the service.	This document
LEGATO (BUS:SOF)	The Management Interface Reference Point between the Business Applications and the Service Orchestration Functionality needed to allow management and operations interactions supporting LSO connectivity services.	This document
PRESTO (SOF:ICM)	The resource Management Interface Reference Point needed to manage the network infrastructure, including network and topology view related management functions.	This document
Service Orchestration Functionality (SOF)	The set of service management layer functionality supporting an agile framework to streamline and automate the service lifecycle in a sustainable fashion for coordinated management supporting design, fulfillment, control, testing, problem management, quality management, usage measurements, security management, analytics, and policy-based management capabilities providing coordinated end-to-end management and control of Layer 2 and Layer 3 Connectivity Services.	This document
SOF-partner	Service Orchestration Functionality in the Partner domain	This document
SOF-sp	Service Orchestration Functionality in the Partner domain	This document
SONATA (BUS:BUS)	The Management Interface Reference Point supporting the management and operations interactions (e.g., ordering, billing, trouble management, etc.) between two network providers (e.g., Service Provider Domain and Partner Domain).	This document

110

Table A1- 1 Terminology and Acronyms

111

5 Replaces Section 10 of MEF 55 – LSO RA Operational Threads

112

Replace Section 10 of MEF 55 with the following text and figures:

113

10 LSO Operational Threads

114 This section is focused on the Operational Threads for the LSO Reference Architecture. Operational
115 Threads describe the high level Use Cases of LSO behavior as well as the series of interactions among
116 LSO management entities, helping to express the vision of the LSO capabilities. The interactions de-
117 scribed within each Operational Thread address the detailed involvement of the Interface Reference
118 Points in the LSO Reference Architecture. Each subsection identifies and outlines some of the opera-
119 tional threads that are being developed as part of the LSO Reference Architecture. Each Operational
120 Thread describes the orchestration within the LSO Reference Architecture highlighting the coordination
121 within a Service Provider domain and also addressing the interactions with both the Customer domain
122 and Partner domain. In addition, Operational Threads are mapped to the requirements they support in the
123 LSO Reference Architecture and Framework. The detailed Operational Threads defined in this section
124 describe the interactions relative to each Interface Reference Point. These interaction details will serve as
125 a foundation for future work on the functional requirements for each Interface Reference Point. Such func-
126 tional requirements will be used as the basis for Interface Profile definitions.

127

Operational Threads identified for LSO include:

128

- Partners on-boarding (to be defined in future version)
- Product Ordering and Service Activation Orchestration
- Controlling a Service
- Customer Viewing Service Performance and Fault Reports and Metrics
- Placing and Tracking Trouble Reports
- Assessing Service Quality Based on SLS
- Collection and Reporting of Billing and Usage
- Securing Management and Control Mechanisms (to be defined in future version)
- Providing Connectivity Services for Cloud (to be defined in future version)

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10.1 Partners On-Boarding

138

10.1.1 Purpose:

139 The Service Provider begins a business relationship with Partner providers. The Product Offering capabil-
140 ities of each Partner are shared with the Service Provider, along with any associated billing information
141 and quality objectives. Rules guiding the business arrangement with the Partner may be codified within
142 Policies. The Service Provider may use the details of the Partner's Product Offerings to identify the poten-
143 tial capabilities of Service Components that could be implemented using the Partner's products. The flow
144 described in this operational thread is intended to represent the generalized steps and associated interac-
145 tions for partner on-boarding.

146

Assumptions: Commercial agreements are established external to this operational thread. Partner can
147 choose the level of detail that is shared with the Service Provider.

148 **10.1.2 Steps:**

149 To be defined.

150

151 **10.2 Product Ordering and Service Activation Orchestration**152 **10.2.1 Purpose:**

153 Describe an operational thread for ordering of a product through activation orchestration within the LSO
154 ecosystem for a connectivity service both within the provider domain and also addressing the partner do-
155 main portion of the service. The intent of this operational thread is to include the various components
156 within the ordering lifecycle including, but not limited to, the use of a product catalog, quoting, and ser-
157 viceability. These capabilities may exist independently outside the order submission process or may be
158 inclusive within the defined order submission workflow.

159 **10.2.2 Steps:**

- 160 1. Customer browses Product catalog and existing Product assets (e.g., existing service locations,
161 existing UNIs, existing Product Instances, etc.): Customer -> CANTATA -> Business Applications
- 162 2. Customer selects, specifies parameters and gets serviceability and a quote for the connectivity
163 Product: Customer -> CANTATA -> Business Applications
- 164 3. Business Applications decompose the product into its services and SOF decomposes the ser-
165 vices into its service components
 - 166 a) Business Application begin determination of the Product serviceability (e.g., interacts with
167 Billing, selection of Partner products, etc.)
 - 168 b) Business Applications request that SOF use its topology information to determine compo-
169 nents of the service within the SP footprint and within the Partner footprint. BUS-sp ->
170 (LEGATO) -> SOF
 - 171 a. An alternative is for the Business Applications to lookup Partnering service op-
172 tions using a Product Catalog instead of topology information.
 - 173 c) Business Applications inquire the SP footprint aspects of serviceability BUS-sp -> LE-
174 GATO -> SOF
 - 175 d) Business Applications inquire the Partner footprint aspects of the service and interrogate
176 the Partner for Serviceability and quotes BUS-sp -> SONATA -> BUS-partner
 - 177 e) Business Applications generate the quote for the Customer: Business Applications ->
178 CANTATA -> Customer
- 179 4. Customer orders connectivity Product: Customer -> CANTATA -> Business Applications
- 180 5. Business Applications perform Product to Service mapping
- 181 6. Business Applications analyze Partner footprint aspect of the ordered Product and places the ap-
182 propriate Product Orders with Partners (and receives Partner commitments): BUS-sp -> SONATA
183 -> BUS-partner
- 184 7. Business Application requests fulfillment of the connectivity Service(s) within the SP footprint:
185 Business Applications -> LEGATO -> SOF
- 186 8. SOF designs the Service Components within the SP footprint (some may exist, some may need
187 to be designed and created) including forwarding constructs across forwarding domains and as-
188 sociated interfaces as well as network functions to support the Service, including identification of
189 the External Providers (e.g., access providers) for any additional forwarding constructs and net-
190 work functions within the Partner footprint.
191 [Note: Determination of Service Components within the Partner footprint may be determined by
192 the Business Applications before the service request is placed or via Partner domain discovery at
193 Service level]

- 194 [Note: SOF might need to initiate the installation request for hardware (e.g., CPE) and be aware
195 of scheduling and lifecycle of all service components]
- 196 9. SOF requests configuration and activation of interfaces, forwarding constructs and network func-
197 tions:
- 198 a) SOF requests configuration and activation of network functions and forwarding constructs
199 across each internal forwarding domain: SOF -> PRESTO -> ICM
- 200 b) SOF requests fulfillment of Product Orders or Service Requests to Partner for connectiv-
201 ity services including components such as network functions, interfaces, and forwarding
202 constructs across each external forwarding domain. There are two options for such inter-
203 actions between the Service Provider and the Partner:
- 204 a. SOF-sp -> INTERLUDE -> SOF-partner(Guided by policy rules with the service
205 definition)
- 206 b. SOF-sp -> LEGATO -> BUS-sp -> SONATA -> BUS-partner
- 207 10. Each ICM determines the elements involved and controls the activation of the network functions
208 and forwarding construct across each element: ICM -> ADAGIO- > ECM
- 209 11. Once the Service Components supporting the Service are successfully configured and activated,
210 SOF orchestrates Service Activation Testing (Note: can be staggered when more than 2 sites):
211 SOF -> PRESTO -> ICM (also SOF-sp -> INTERLUDE -> SOF-partner for partner components)
- 212 12. When the end-to-end testing is successful:
- 213 a) SOF synchronizes and activates proactive performance monitoring for the service and
214 components (can be staggered when more than 2 sites)
- 215 [Note: It is possible to address testing failures with policy driven closed loop control]
- 216 13. When all testing is completed (can be staggered when more than 2 sites), the SOF performs the
217 state change for the Service (per order component) and informs the Business Applications that
218 the service is now active. (note: state changes will be tracked and made available to the customer
219 throughout ordering and activation): SOF -> LEGATO -> Business Applications
- 220 14. The customer is notified that the Product Instance is ready to use: Business Applications -> CAN-
221 TATA -> Customer
- 222 15. Customer performs testing and accepts the Product Instance: Customer -> CANTATA -> Busi-
223 ness Applications
- 224 a) E.g., Billing capability for the product assets (can be staggered); Billing commences

225

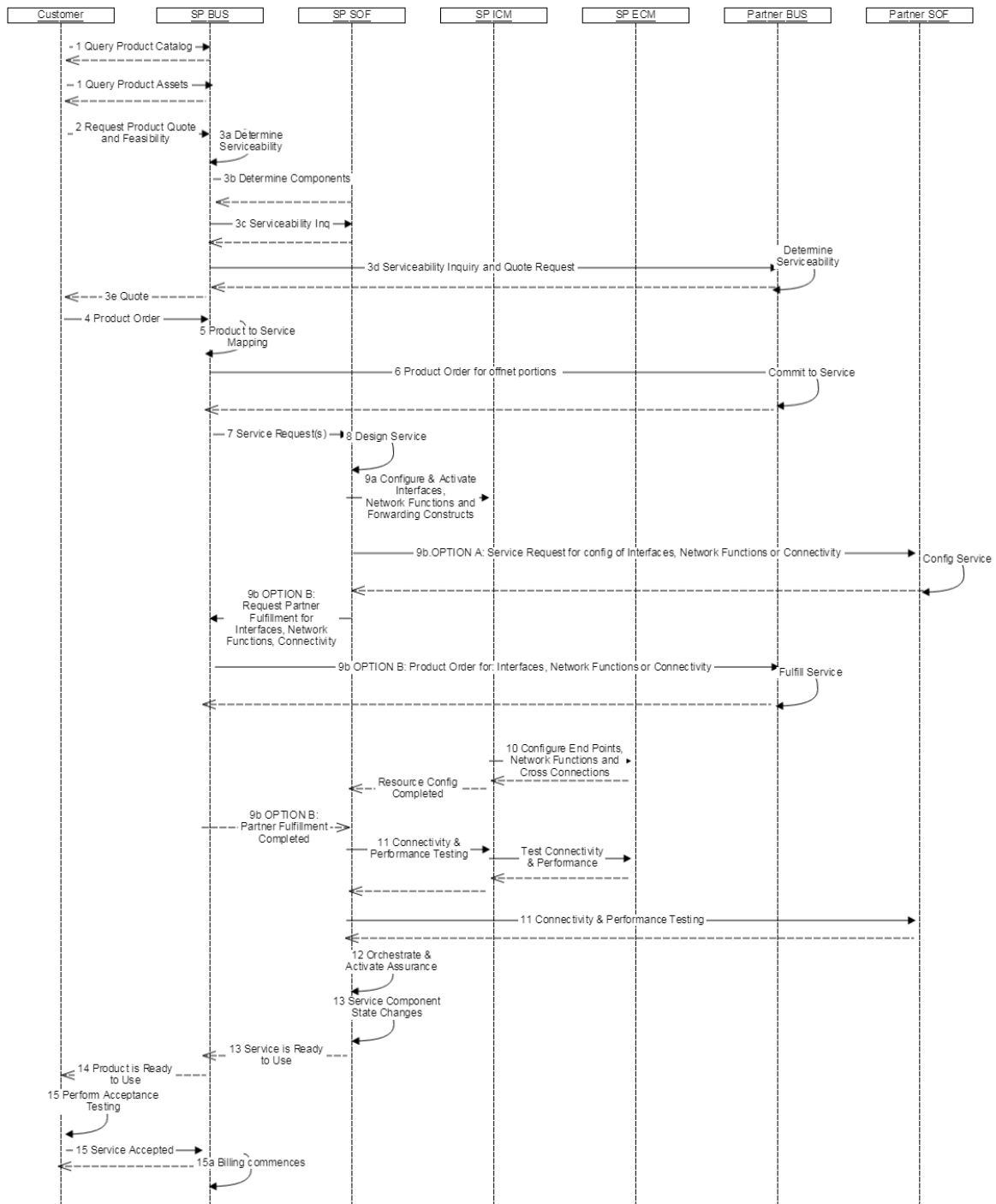


Figure A1- 1 Product Ordering and Service Activation Orchestration Sequence Diagram

227 10.3 Controlling a Service

228 10.3.1 Purpose:

229 The Customer initiates a request to dynamically control a permitted aspect of its Service (e.g., bandwidth
230 change or implementing traffic filtering controls, etc.).

231 In the Service Provider domain, LSO uses the defined service constraints and policies to determine if the
232 dynamic control request is permitted and parameterized within the permissible bounds. If the dynamic
233 control request needs to be supported by Service Components within a Partner domain, LSO coordinates
234 the changes needed to support the request with the Partner. In addition, LSO effects the necessary
235 changes within its own domain to service the request. The updated Service Components are tested. The
236 Customer is also informed about the status of the request.

237 10.3.2 Steps:

- 238 1. Customer queries the defined constraints and policies that describe the permitted dynamic be-
239 havior of the Service (e.g., bandwidth change or implementing traffic filtering controls, bounds on
240 parameters, etc.): Customer -> ALLEGRO > SOF-sp
241 [Note: Dynamic behavior at the service level is derived from the customer product contract]
- 242 2. Customer requests changes in Service related parameters as permitted by the defined con-
243 straints and policies : Customer -> ALLEGRO > SOF-sp
- 244 3. SOF-sp verifies that the requested changes fall within the permitted constraints, bounds, and poli-
245 cies.
- 246 4. SOF-sp identifies Service Components including forwarding constructs across forwarding do-
247 mains and associated interfaces as well as network functions that need to be reconfigured in sup-
248 port of the request. This includes identification of the Service Components supported by External
249 Providers (e.g., access providers) for update to any necessary forwarding constructs and network
250 functions within the Partner footprint.
- 251 5. SOF-sp requests reconfiguration of identified interfaces, forwarding constructs and network func-
252 tions:
 - 253 1. SOF-sp requests reconfiguration of identified Service Components within the internal for-
254 warding domains of the Service Provider: SOF-sp -> PRESTO -> ICM
 - 255 2. SOF-sp requests reconfiguration to External Providers for identified Service Components
256 (Partner Services) across each external forwarding domain: SOF-sp -> INTERLUDE ->
257 SOF-partner
- 258 6. Each ICM determines the elements involved and controls the reconfiguration of the network func-
259 tions and forwarding construct across each element: ICM -> ADAGIO- > ECM
- 260 7. Each ICM reports back the results of the reconfiguration request: ICM -> PRESTO -> SOF-sp
- 261 8. Each External Provider reports back the results of the reconfiguration request: SOF-partner ->
262 INTERLUDE-> SOF-sp
- 263 9. SOF-sp requests testing of identified Service Components (e.g., interfaces, forwarding constructs
264 and network functions):
 - 265 1. SOF-sp requests testing of identified Service Components within the internal forwarding
266 domains of the Service Provider: SOF-sp -> PRESTO -> ICM
 - 267 2. SOF-sp requests testing to External Providers for identified Service Components (Partner
268 Services) across each external forwarding domain: SOF-sp -> INTERLUDE -> SOF-part-
269 ner
- 270 10. Each ICM determines the elements involved and controls the testing of the network functions and
271 forwarding construct across each element: ICM -> ADAGIO- > ECM
- 272 11. Each ICM reports back the results of the testing request: ICM -> PRESTO -> SOF-sp
- 273 12. Each External Provider reports back the results of the testing request: SOF-partner -> INTER-
274 LUDE-> SOF-sp

- 275 13. Once the Service Components supporting the request are successfully reconfigured and tested,
 276 SOF-sp synchronizes the Inventory and Assurance capabilities for the Service and Service Com-
 277 ponents.
 278 14. SOF-sp generates a Usage Event to the Business Applications for Product Instance: SOF-sp ->
 279 LEGATO -> Business Applications
 280 Note: The Business Applications determine billing impact of the Usage Events due to service con-
 281 trol changes.
 282 15. The customer is notified that the Service is updated, tested, and is ready to use: SOF-sp -> AL-
 283 LEGRO-> Customer

284 **Variations:** scheduled changes; reservations;

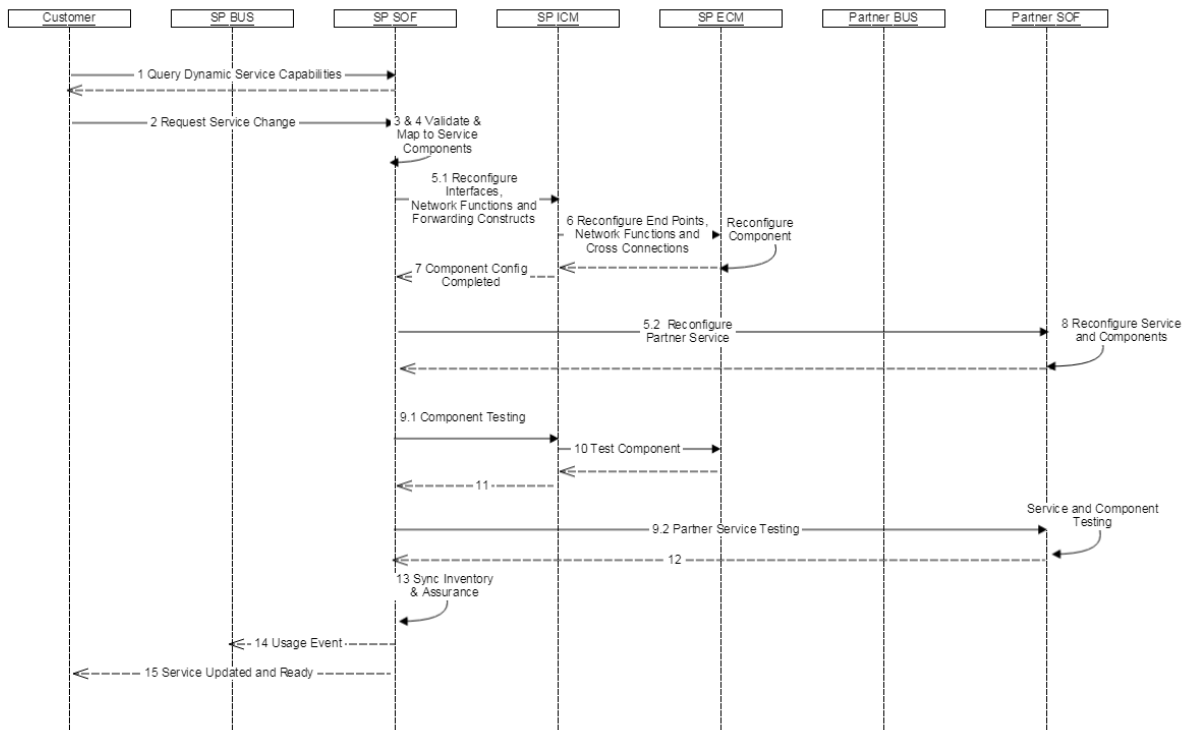


Figure A1- 2 Controlling a Service Sequence Diagram

285

286 10.4 Customer Viewing Service Performance and Fault Reports and Metrics

287 10.4.1 Purpose:

288 The Customer wishes to view performance and fault information related to its Product Instances and as-
289 sociated Services. In the Service Provider domain, LSO may receive fault and performance related infor-
290 mation about the Service, either end-to-end or per each Service Component. This information is orga-
291 nized to facilitate the evaluation of the overall performance and status associated with the Customer's
292 Services and Product Instances. LSO gathers the information requested by the Customer and assembles
293 it into a report. The Customer may also request that reports be generated on a scheduled or exception
294 basis.

295 10.4.2 Steps:

- 296 1. The Customer retrieves information about the types of Performance and Fault Reports that may
297 be requested for a specific Service: Customer -> ALLEGRO -> SOF-sp
- 298 2. The Customer requests a specific Performance or Fault Report related to existing Services and /
299 or a visible Service Components (e.g., If the SP permits the Customer to view specific connectiv-
300 ity flows or network functions etc.): Customer -> ALLEGRO-> SOF-sp
- 301 3. SOF-sp determines the Information (e.g., Performance or Fault Metrics) that are needed in order
302 to assemble the Performance or Fault Report requested by the Customer.
- 303 4. If the needed Information are not cached and current:
 - 304 1. SOF-sp requests the Information from the ICM domains that are responsible for generat-
305 ing the needed pieces of information: SOF-sp -> PRESTO -> ICM; ICM -> ADAGIO ->
306 ECM
 - 307 2. SOF-sp requests the Information from the Partner domains that are responsible for gen-
308 erating the needed pieces of information: SOF-sp -> INTERLUDE -> SOF-partner
- 309 5. SOF-sp assembles the Performance or Fault Report containing the Information requested by the
310 Customer, and alerts the Customer of the Performance or Fault Report availability: SOF-sp ->
311 ALLEGRO -> Customer
- 312 6. The Customer retrieves the Performance or Fault Report from the Service Provider: SOF-sp ->
313 ALLEGRO -> CUSTOMER

314 Variations:

315 Scheduled Performance Reports

316 Triggered Performance Reports (e.g., SLS threshold exceeded, policy based, etc.)

317

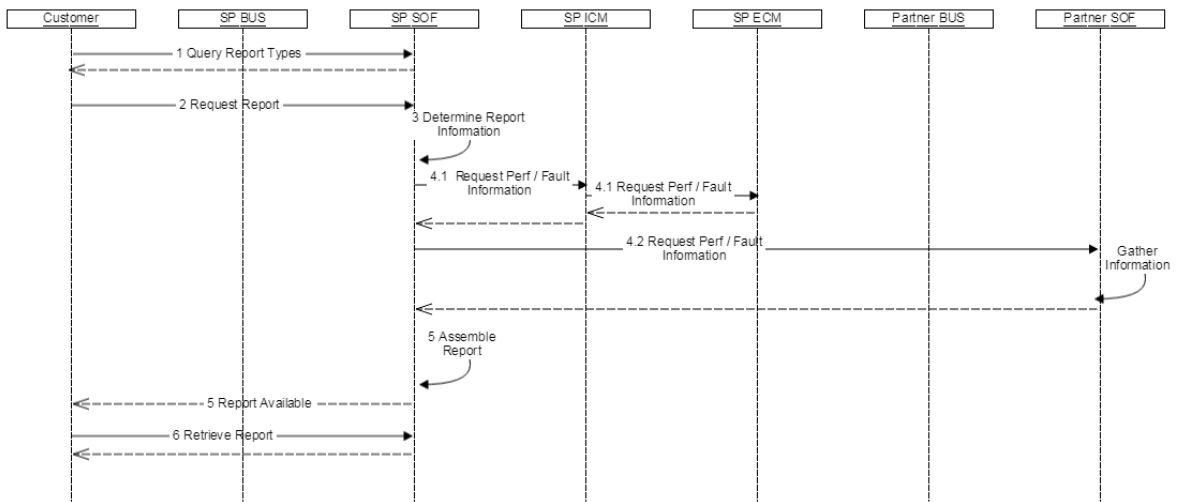


Figure A1- 3 Customer Viewing Service Performance and Fault Reports and Metrics Sequence Diagram

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319

320 10.5 Placing and Tracking Trouble Reports

321 10.5.1 Purpose:

322 Trouble Reports related with the Customer's Product Instances and Services may be placed by the Customer. In the Service Provider, LSO gathers and fuses trouble and fault information related to the Customer's Product Instances and Services and associates it to the Trouble Report. LSO would also attempt to remedy the reported trouble by reconfiguring, reassigning, and / or rerouting aspects of the Service. LSO also indicates if manual intervention is required to resolve the trouble, and tracks the status of any associated repair activities to help determine trouble resolution status. The status of trouble resolution is reported back to the Customer.

329 10.5.2 Steps:

- 330 1. Customer provides a Trouble Report related to a connectivity Product: Customer -> CANTATA ->
331 Business Applications
- 332 2. Business Applications perform Product to Service mapping
- 333 3. Business Applications inform SOF of the customer reported problem with the connectivity Service(s): Business Applications -> LEGATO -> SOF-sp
- 334 4. SOF analyzes the reported problem on the Service and identifies related Service Components including forwarding constructs across forwarding domains and associated interfaces as well as network functions supporting the Service, including identification of the Service Components provided by Partners
- 335 5. SOF identifies any previously detected errors and faults that are correlated to the Service or Service Components.
- 336 6. SOF requests current configuration and fault information related to the identified interfaces, forwarding constructs and network functions:
 - 337 1. SOF requests configuration and fault information of network functions and forwarding constructs across each internal forwarding domain: SOF-sp -> PRESTO -> ICM
 - 338 2. SOF requests configuration and fault information of Service Components in each external forwarding domain: SOF-sp -> INTERLUDE -> SOF-partner
- 339 7. If not already cached, each ICM determines the elements involved and requests fault and configuration for the network functions and forwarding construct across each element: ICM -> ADAGIO -> ECM
- 340 8. Once the configuration and fault information for the Service Components supporting the Service are successfully gathered, SOF analyzes the information to diagnose and identify the Trouble, if necessary SOF orchestrates additional end-to-end and per Service Component testing: SOF-sp -> PRESTO -> ICM (also SOF-sp -> INTERLUDE -> SOF-partner for partner components)
- 341 9. SOF coordinates and tracks the resolution of the Trouble, including reconfiguring, reassigning, and / or rerouting aspects of the Service.
- 342 10. SOF also indicates if manual intervention is required to resolve the trouble, and tracks the status of any associated repair activities to help determine trouble resolution status.
- 343 11. The status of trouble resolution is reported to the Business Applications: SOF-sp -> LEGATO -> Business Applications
- 344 12. The status of trouble resolution is reported to the Customer: Business Applications -> CANTATA -> Customer (ALTERNATIVE, SOF could provide updates via ALLEGRO)

362 **ALTERNATIVE:** proactive trouble detection.

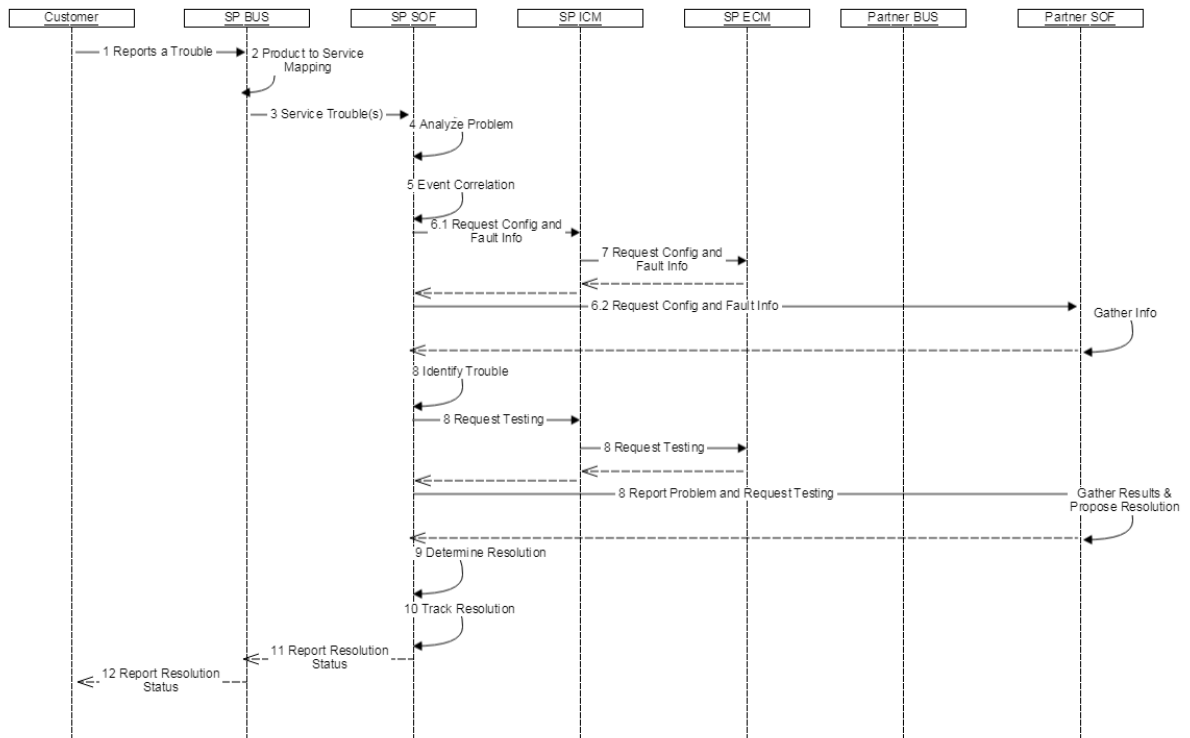


Figure A1- 4 Placing and Tracking Trouble Reports Sequence Diagram

364 10.6 Assessing Service Quality Based on SLS

365 10.6.1 Purpose:

366 The Service Provider needs to determine if the SLS for a Service is being met. Service quality is analyzed
367 by gathering the necessary service performance related measurement and comparing these service per-
368 formance metrics with the service quality objectives described in the SLS.

369 10.6.2 Steps:

- 370 1. Periodically, SOF requests current performance information related to the identified interfaces,
371 forwarding constructs and network functions. (Note: Instead of, or in addition to, periodic polling,
372 the ICM (via PRESTO) or the partner SOF (via INTERLUDE) might also send TCAs when partic-
373 ular performance thresholds are crossed):
 - 374 1. SOF requests performance information of network functions and forwarding constructs
375 across each internal forwarding domain: SOF-sp -> PRESTO -> ICM
 - 376 2. SOF alerts Partner and requests performance information of Service Components in
377 each external forwarding domain: SOF-sp -> INTERLUDE -> SOF-partner
- 378 2. If not already cached, each ICM determines the elements involved and requests performance in-
379 formation for the network functions and forwarding construct across each element: ICM -> ADA-
380 GIO- > ECM
- 381 3. Once the performance information for the Service Components supporting the Service are suc-
382 cessfully gathered, SOF analyzes the information based on the SLS to identify the performance
383 degradation, if necessary SOF orchestrates additional end-to-end and per Service Component
384 testing: SOF-sp -> PRESTO -> ICM (also SOF-sp -> INTERLUDE -> SOF-partner for partner
385 components)
- 386 4. SOF coordinates and tracks the resolution of SLS related degradations, including reconfiguring,
387 reassigning, and / or rerouting aspects of the Service.
- 388 5. SOF also indicates if manual intervention is required to resolve the degradation, and tracks the
389 status of any associated activities to help determine resolution status.
- 390 6. The status of SLS degradation resolution is reported to the Business Applications: SOF-sp -> LE-
391 GATO -> Business Applications
- 392 7. The status of SLS degradation resolution is reported to the Customer: Business Applications ->
393 CANTATA -> Customer (ALTERNATIVE, SOF could provide updates via ALLEGRO)

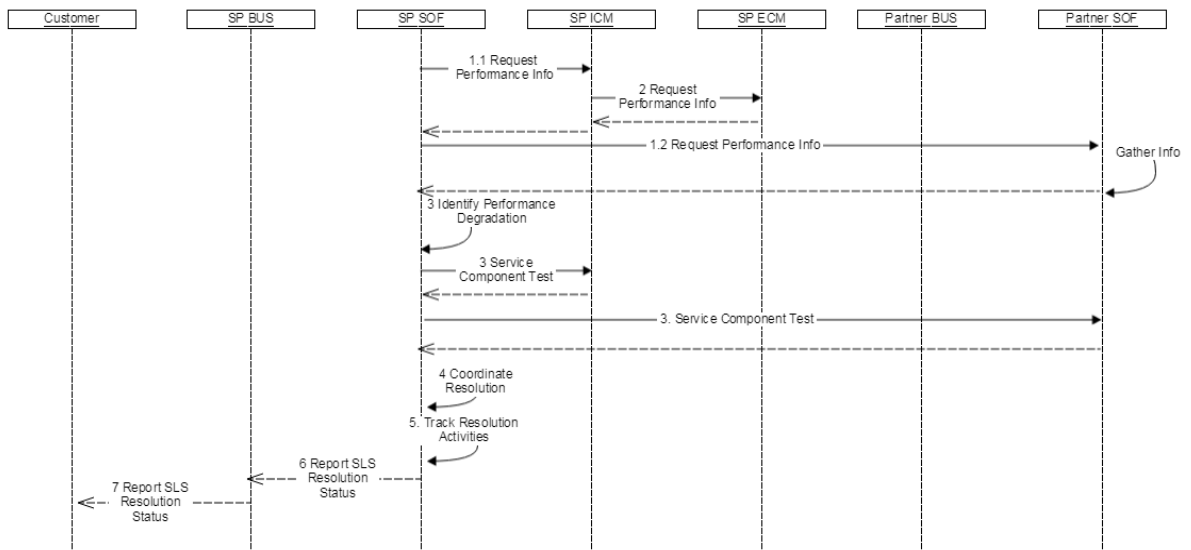


Figure A1- 5 Assessing Service Quality Based on SLS Sequence Diagram

394

395 10.7 Collection and Reporting of Billing and Usage

396 10.7.1 Purpose:

397 The Service Provider gathers relevant usage measurements and usage events in order to generate and
398 provide a bill to the Customer. LSO collects usage measurements, traffic measurements, and service-re-
399 lated usage events (e.g., Customer initiated changes in service bandwidth, etc.) describing the usage of
400 Service Components and associated resources. This information is correlated to specific Services and
401 Product Instances. The appropriate business applications perform rating and billing based on the usage
402 information and business rules. Where Service Components have been used beyond their SLS commit-
403 ments (e.g. counting yellow traffic that provides an opportunity to upsell the customer), exception reports
404 may be generated. Note: Partner domains may also be involved in reporting usage and generation of bill-
405 ing information.

406 10.7.2 Asynchronous Event-Driven Steps:

- 407 i. SOF reports service usage events to business applications: SOF-sp -> LEGATO -> BUS
- 408 ii. SOF reports SLS violations and beyond SLS exceptions to business applications: SOF-sp -> LE-
409 GATO -> BUS

410 10.7.3 Steps:

- 411 1. SOF requests current traffic and usage information related to the interfaces, forwarding con-
412 structs and network functions related to the service instance. Note: Usage can be delivered as
413 scheduled reports:
 - 414 1. SOF requests traffic and usage information of network functions and forwarding con-
415 structs across each internal forwarding domain: SOF-sp -> PRESTO -> ICM
 - 416 2. SOF requests traffic and usage information of Service Components in each external for-
417 warding domain: SOF-sp -> INTERLUDE -> SOF-partner
- 418 2. If not already cached, each ICM determines the elements involved and requests traffic and usage
419 information for the network functions and forwarding construct across each element: ICM -> ADA-
420 GIO- > ECM
- 421 3. Once the traffic and usage information for the Service Components supporting the Service are
422 successfully gathered, SOF analyzes the information for specific Service instances.
- 423 4. SOF reports traffic and usage summary to business applications: SOF-sp -> LEGATO -> BUS
- 424 5. Business applications perform rating and billing based on the usage information and business
425 rules
- 426 6. Bill is provided to Customer: BUS-sp -> CANTATA -> Customer

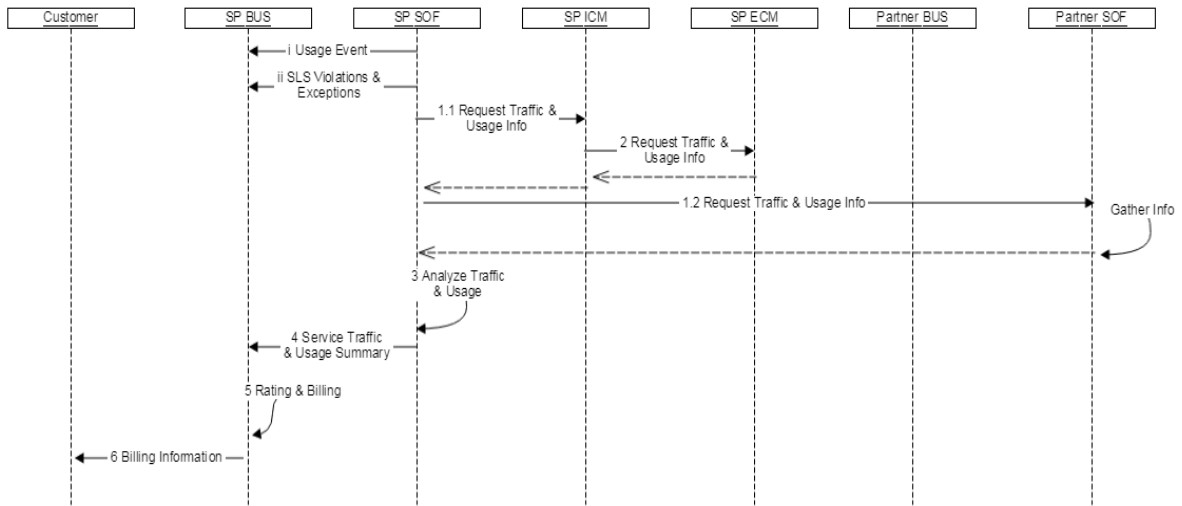


Figure A1- 6 Collection and Reporting of Billing and Usage Sequence Diagram

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429 **10.8 Securing Management and Control Mechanisms**

430 **10.8.1 Purpose:**

431 The Service Provider needs to provide security for its management and control mechanisms. In this Oper-
432 ational Thread, LSO manages controlled access to management and control functions, including authenti-
433 cation, authorization, and auditing within LSO and with Partner and Customer domains.

434 **10.8.2 Steps:**

435 To be defined.

436 **10.9 Providing Connectivity Services for Cloud**

437 **10.9.1 Purpose:**

438 The Customer Application Coordinator in the Customer domain manages the various service needs of the
439 cloud based applications it is supporting. It may determine that additional capacity is needed between two
440 data centers in order to provide for the demands of the applications. The Customer Application Coordina-
441 tor interacts with the Service Provider to control the bandwidth of the Connectivity Services between
442 these two data centers.

443 **10.9.2 Steps:**

444 To be defined.

445

446