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| Test Case Number Version | SDO\_iter\_1\_feature\_1 |
| Test Case Title | Deployment Support for Federation scenario |
| Module tested | Service Deployment Optimizer (SDO) |
| Related ticket (s) | 814 |
| Target | In runtime federation case, the goal of the SDO is to find the best possible IP to federate/host a data VM. The best IP should fulfil the TREC requirements specified by the Data Manager, and also (according to the Federation Candidate Selector in the Data manager) keep cross-IP data traffic at a suitable level. To ensure the latter the latter, data activity information of VMs that belong to the current service is also taken into consideration during the decision-making, as is the mount of data traffic generated by the VMs. This data activity information is retrieved from the Data Manager. |
| Initial condition(s) | 1. A service deployed and running in an IP (IP1), with an additional VM deployed in a remote IP (IP2). The remote VM can be started as a result of either bursting or deployment time federation. Both IP1 and IP2 must have full installations of the OPTIMIS Toolkit. The SDO deployed in IP1 (for bursting and federation) must have its IP Registry configured with information about IP2, and preferably also other OPTIMIS IPs, the latter to ensure that the correct IP is selected. 2. The DataManager determines that data federation is required. This can in term be triggered either by hand, or, e.g., through risk. The Data Manager contacts the SDO to start the scenario. |
| Expected results | A new data VM is started in a remote IP, namely in IP2. The location of the new VM can be confirmed using the Data Manager GUI (by investigating data VM location in the embedded Google map). |
| Status | Completed. |
| Owner | Wubin Li (UMU), Petter Svärd (UMU) |
| Assigned | SCAI (Hassan) |
| Steps | N/A |
| Feedback receiver | Wubin Li (UMU), Petter Svärd (UMU) |
| Start date | M24 |
| End date | M36 |
| Passed? | Steps are not specified, so testing is not possible. But it seems ok (see the comment below). |
| Bug ID |  |
| Problems |  |
| Required changes |  |
| Comments | This test case is included in the Test Cases for UCs (Ticket number: 631). |

Table 1: Deployment support for Federation UC.

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| Test Case Number Version | SDO\_iter\_1\_feature\_2+iter\_2\_feature\_8+iter\_2\_feature\_9 |
| Test Case Title | Deployment and Undeployment Support for Broker Scenario |
| Module tested | Service Deployment Optimizer (SDO) |
| Related ticket(s) | 815, 713, 714, 936 |
| Target | The SDO must be able to deploy a service to the broker using the exact same procedure as it would when deploying directly to an IP. The SDO creates an agreement and uploads VM images directly to the broker, which in term is responsible for all finding deployment targets, negotiating terms, uploading data images, creating agreements, etc. with the third-party providers (the IPs that run the service components). |
| Initial condition(s) | 1. One SP with OPTIMIS Toolkit installation. The IP Registry of the SDO must contain information about only one “IP”, namely the broker. 2. A host configured with the broker software. The IP Registry of the broker must know about at least two IPs (where the broker can deploy services). 3. A service to deploy, which should be available in the SP machine. 4. The broker will call the SDO to start this scenario. |
| Expected results | Service deployment completion through broker, i.e.,   1. The service is deployed from the SP host to the broker. 2. The broker in terms deploys the service in one or more IPs, including agreement creation. 3. An agreement is created between the SP and broker. 4. After the service is deployed, an undeployment action is triggered. 5. The deployed service is undeployed. |
| Status | Completed. |
| Owner | Wubin Li (UMU), Petter Svärd (UMU) |
| Assigned | SCAI (Hassan) |
| Steps | N/A |
| Feedback receiver | Wubin Li (UMU), Petter Svärd (UMU) |
| Start date | M24 |
| End date | M36 |
| Passed? | Steps are not specified, so testing is not possible. But it seems ok (see the comment below). |
| Bug ID |  |
| Problems |  |
| Required changes |  |
| Comments | This test case is included in the Test Cases for UCs (Ticket number: 632, 936). |

Table 2: Deployment support for Brokerage UC.

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| Test Case Number Version | SDO\_iter\_1\_feature\_3+ feature\_6+ feature\_7 |
| Test Case Title | Service deployment & undeployment functionalities |
| Module tested | Service Deployment Optimizer (SDO) |
| Related ticket(s) | 816, 819, 820 |
| Target | The SDO must be able to deploy a service to an IP by the means of coordinating other Y3 components. The SDO negotiates with the IP, performs VM contextualization, uploads VM images, and creates an agreement with the IP. |
| Initial condition(s) | 1. One IP with OPTIMIS toolkit installed, and configured. 2. A service to be deployed. The service manifest may not contain any information that restricts the usage of any of the available IPs (TREC constraints, legal constraints, or the similar). 3. An OPTIMIS SP with an SDO installation. The IP Registry associated with the SDO must be configured with information about IP1 and IP2, to ensure that these will be considered as deployment targets by the SDO. |
| Expected results | The service is deployed to the IP successfully, and then undeployed. |
| Status | Completed. |
| Owner | Wubin Li (UMU), Petter Svärd (UMU) |
| Assigned | SCAI (Hassan) |
| Steps | 1. Log in spvm1.atos (optimis-spvm.atosorigin.es). 2. Run ‘visit ds’ in terminal, and go to the project folder. 3. Run the following command: ‘mvn test -Dtest= Y3BasicsTest’ 4. Check the output results in the Terminal to see if it’s successful or not. |
| Feedback receiver | Wubin Li (UMU), Petter Svärd (UMU) |
| Start date | M24 |
| End date | M36 |
| Passed? | YES |
| Bug ID |  |
| Problems |  |
| Required changes |  |
| Comments | For ticket 820, there is no newer implementation yet. As there is no conclusion finalized by the TREC team and HM, the current solution is just using the Y2 version. |

Table 3: SDO Y3 deployment & undeployment functionalities test case.

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| Test Case Number Version | SDO\_iter\_1\_feature\_5 |
| Test Case Title | Service deployment with anti-affinity constraints |
| Module tested | Service Deployment Optimizer (SDO) |
| Related ticket(s) | 818 |
| Target | To correctly handle anti-affinity constraints when deploying a service, the DO (Deployment Optimizer) must be able to read anti-affinity constraints info from the service manifest retrieved during service deployment and ensure that all this constraints adhere in the optimal placement solution that is calculated. |
| Initial condition(s) | 1. Two IPs (IP1, IP2) with OPTIMIS toolkit installed, and configured. 2. A service to be deployed. In this service, two of the components (A, and B) are bounded by anti-affinity constraints at the IP-level (specified in the service manifest). The service manifest may not contain any information (TREC constraints, legal constraints, or the similar) that prevents deployment of any of A and B on IP1 or IP2. 3. An OPTIMIS SP with an SDO installation. The IP Registry associated with the SDO must be configured with information about IP1 and IP2, to ensure that these will be considered as deployment targets by the SDO. |
| Expected results | The service is de-composited to two sub-services; the one with component A is deployed to IP1, the other with component B is deployed to IP2. Alternatively, the opposite solution may be the result, with component A deployed at IP2 and B in IP1. However, under no circumstance should A and B be deployed in the same IP. |
| Status | Completed. |
| Owner | Wubin Li (UMU), Petter Svärd (UMU) |
| Assigned | SCAI (Hassan) |
| Steps | 1. Log in spvm1.atos (optimis-spvm.atosorigin.es). 2. Run ‘visit ds’ in command line,   it will go to the project folder.   1. Run the following command:   ‘mvn test -Dtest=DeploymentOptimizationTest#testAntiAffintyDeployment’   1. Check the output results in the Terminal to see if it’s successful or not. |
| Feedback receiver | Wubin Li (UMU), Petter Svärd (UMU) |
| Start date | M24 |
| End date | M36 |
| Passed? | YES |
| Bug ID |  |
| Problems |  |
| Required changes |  |
| Comments |  |

Table 4: Anti-affinity constraints extraction test case.

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| Test Case Number Version | SDO\_iter\_1\_feature\_4+iter\_2\_feature\_11 |
| Test Case Title | Deployment optimization for large-sized problem |
| Module tested | Service Deployment Optimizer (SDO) |
| Related ticket(s) | 817, 716 |
| Target | For Y3, with better algorithm, SDO is able to handle larger-sized problem. |
| Initial condition(s) | 1. A service manifest composed of 20 components without affinity constraints and anti-affinity constraints. 2. Two IPs (IP1, IP2) with OPTIMIS toolkit installed, and configured. 3. An OPTIMIS SP with an SDO installation. The IP Registry associated with the SDO must be configured with information about IP1 and IP2, to ensure that these will be considered as deployment targets by the SDO. |
| Expected results | A feasible placement solution would be generated by SDO. |
| Status | Completed. |
| Owner | Wubin Li (UMU), Petter Svärd (UMU) |
| Assigned | SCAI (Hassan) |
| Steps | 1. Log in spvm1.atos (optimis-spvm.atosorigin.es). 2. Run ‘visit ds’ in command line, then goes to the project folder. 3. Run the following command:   ‘mvn test -Dtest=DeploymentOptimizationTest#testLargerSizeProblem’   1. Check the output results in the Terminal to see if it’s successful or not. |
| Feedback receiver | Wubin Li (UMU), Petter Svärd (UMU) |
| Start date | M24 |
| End date | M36 |
| Passed? | YES |
| Bug ID |  |
| Problems |  |
| Required changes |  |
| Comments |  |

Table : SDO with large sized problem test case.