EWP+

IIAs Exchange Use Cases and Scenarios

IT Center of the Aristotle University of Thessaloniki

ewp-plus@it.auth.gr

SECTION 1 – BINDING IIA IDS

HEI A: EWP Dashboard		HEI B
Given that Dashboard created a new IIA		
When Dashboard is ready to share it with B		
Then Dashboard sends an IIA CNR to B		
And Dashboard waits for an IIA CNR Response	IIA CNR: notifier_hei=a, iia_id=a.iia_id →	
		When B receives an IIA CNR from Dashboard
	←IIA CNR Empty Response	Then B sends an IIA CNR Empty Response to Dashboard
	←IIA GET Request: hei_id=a,iia_id=a.iia_id	And B sends an IIA GET Request to Dashboard
When Dashboard receives an IIA CNR Response from B		And B waits for a response to the IIA GET Request
Then Dashboard is sure that B received the IIA CNR		
When Dashboard receives an IIA GET Request from B		
Then Dashboard searches for the IIA with id a.iia_id		
And Dashboard prepares the IIA GET Response		
# The response contains the hash of the cooperation conditions calculated by Dashboard (a.hash_1)		
And Dashboard sends the IIA GET Response (Ex 1) to B	Ex 1 IIA GET Response →	
		When B receives the Ex 1 IIA GET Response
		Then B checks whether IIA Response is valid

		If IIA Response is valid Then B checks whether it matches with a local IIA If IIA does not match with a local IIA Then B creates a new local IIA with id b.iia_id And B saves Dashboard's iia_id (a.iia_id) and Dashboard's hash (a.hash_1)
At Dashboard's IIAs database a.iia_id | … | a.hash_1 | |		**At B's IIAs database** b.iia_id | … | b.hash_1 | a.iia_id | a.hash_1

		Given that in B a new IIA has been created
	←IIA CNR: notifier_hei=b,iia_id=b.iia_id	Then B sends an IIA CNR to Dashboard
When Dashboard receives an IIA CNR from B		And B waits for an IIA CNR Response
Then Dashboard sends an IIA CNR Empty Response to B	IIA CNR Empty Response →	When B receives an IIA CNR Response from Dashboard
		Then B is sure that Dashboard received the IIA CNR
And Dashboard sends an IIA GET Request to B	IIA GET Request:	
And Dashboard waits for a response to the IIA GET request	hei_id=b,iia_id=b.iia_id →	When B receives an IIA GET Request from Dashboard
		Then B searches for the IIA with id b.iia_id
		And B prepares the IIA GET Response
		# The response contains the hash of the cooperation conditions calculated by B (b.hash_1)
When Dashboard receives the Ex 2 IIA GET Response	←Ex 2 IIA GET Response	And B sends the IIA GET Response (Ex 2) to Dashboard
Then Dashboard checks whether IIA Response is valid		
If IIA is valid		
Then Dashboard checks whether it matches with a local IIA		
If IIA matches with a local IIA		
Then Dashboard checks whether B's iia id is contained in its local IIA		
If IIA does not contain B's iia id		
Then Dashboard updates its local IIA with B's iia id and B's hash		

At Dashboard's IIAs database

a.iia_id	…	a.hash_1	b.iia_id	b.hash_1

At B's IIAs database

b.iia_id	…	b.hash_1	a.iia_id	a.hash_1

Notice that:

1) B created an IIA CNR after receiving a new IIA from A although B did not make any changes, in order to tell A about its b.iia_id and b.hash_1.

SECTION 2 – EDITING AN IIA

HEI A: EWP Dashboard		HEI B
Given that Dashboard and B have a bound IIA		
When Dashboard makes changes to the IIA		
Then Dashboard sends an IIA CNR to B	IIA CNR: notifier_hei=a,iia_id=a.iia_id →	
And Dashboard waits for an IIA CNR Response		When B receives an IIA CNR from Dashboard
		Then B sends an IIA CNR Empty Response to Dashboard
When Dashboard receives an IIA CNR Response from B	←IIA CNR Empty Response	And B sends an IIA GET Request to Dashboard
Then Dashboard is sure that B received the IIA CNR	←IIA GET Request: hei_id=a,iia_id=a.iia_id	And B waits for a response to the IIA GET Request
When Dashboard receives an IIA GET Request from B		
Then Dashboard searches for the IIA with id a.iia_id		
And Dashboard prepares the IIA GET Response		
# The response contains the hash of the cooperation conditions recalculated by Dashboard (a.hash_2)		
And Dashboard sends the IIA GET Response (Ex 3) to B	Ex 3 IIA GET Response →	

<table>
<tr><td></td><td></td><td>When B receives the Ex 3 IIA GET Response
Then B checks whether IIA Response is valid
If IIA Response is valid
Then B checks whether it matches with a local IIA
If IIA matches with a local IIA
Then B checks if Dashboard made changes to the IIA
If Dashboard changed the IIA
Then B updates Dashboard's hash in its local IIA
Then B updates its local IIA
Then B recalculates its local IIA hash</td></tr>
<tr><td>At Dashboard's IIAs database
<table><tr><td>a.iia_id</td><td>…</td><td>a.hash_2</td><td>b.iia_id</td><td>b.hash_1</td></tr></table></td><td></td><td>At B's IIAs database
<table><tr><td>b.iia_id</td><td>…</td><td>b.hash_2</td><td>a.iia_id</td><td>a.hash_2</td></tr></table></td></tr>
<tr><td>When Dashboard receives an IIA CNR from B
Then Dashboard sends an IIA CNR Empty Response to B

And Dashboard sends an IIA GET Request to B
And Dashboard waits for a response to the IIA GET request</td><td>←notifier_hei=b,iia_id=b.iia_id: IIA CNR
IIA CNR Empty Response →

IIA GET Request: hei_id=b,iia_id=b.iia_id →</td><td>Given that B's local IIA hash changed
Then B sends an IIA CNR to Dashboard
And B waits for an IIA CNR Response
When B receives an IIA CNR Response from Dashboard
Then B is sure that Dashboard received the IIA CNR

When B receives an IIA GET Request from Dashboard
Then B searches for the IIA with id b.iia_id</td></tr>
</table>

<table>
<tr>
<td>When Dashboard receives the Ex 4 IIA GET Response
Then Dashboard checks whether IIA Response is valid
If IIA is valid
  Then Dashboard checks whether it matches with a local IIA
    If IIA matches with a local IIA
      Then Dashboard checks if B made changes
        If B changed the IIA
          Then Dashboard updated B’s hash in its local IIA
          Then Dashboard saves the changes in its local IIA
          Then Dashboard recalculates its local IIA hash</td>
<td>←Ex 4 IIA GET Response</td>
<td>And B prepares the IIA GET Response
The response contains the hash of the cooperation conditions calculated by B (b.hash_2)
And B sends the IIA GET Response (Ex 4) to Dashboard</td>
</tr>
<tr>
<td>At Dashboard’s IIAs database
<table><tr><td><code>a.iia_id</code></td><td>…</td><td><code>a.hash_2</code></td><td><code>b.iia_id</code></td><td><code>b.hash_2</code></td></tr></table></td>
<td></td>
<td>At B’s IIAs database
<table><tr><td><code>b.iia_id</code></td><td>…</td><td><code>b.hash_2</code></td><td><code>a.iia_id</code></td><td><code>a.hash_2</code></td></tr></table></td>
</tr>
</table>

Notice that:

2) B created an IIA CNR after receiving changes from Dashboard, in order to tell Dashboard about its b.hash_2.

SECTION 3 – APPROVING AN IIA

HEI A: EWP Dashboard		HEI B
Given that Dashboard and B have exchanged their IIA Ids **And** Dashboard has the latest version of B's hash **When** Dashboard wants to approve an IIA **Then** Dashboard sends an IIA Approval CNR to B **And** Dashboard waits for an IIA Approval CNR Response	IIA Approval CNR: approving_hei=a,owner_hei=b,iia_id=b.iia_id → ←IIA Approval CNR Empty Response	When B receives an IIA Approval CNR from Dashboard Then B sends an IIA Approval CNR Empty Response to Dashboard
When Dashboard receives an IIA Approval CNR Response from B **Then** Dashboard is sure that B received the IIA Approval CNR	←IIA Approval Request: approving_hei=a,owner_hei=b,iia_id=b.iia_id	And B sends an IIA Approval Request to Dashboard And B waits for a response to the IIA Approval Request
When Dashboard receives an IIA Approval Request from B **Then** Dashboard searches for the IIA with B's id **If** IIA is approved in Dashboard **Then** Dashboard prepares the IIA Approval Response		When B receives the Ex 5 IIA Approval Response

# The response contains the latest B's hash that Dashboard knows (b.hash_2) **And** Dashboard sends the IIA Approval Response (Ex 5) to B	Ex 5 IIA Approval Response →	Then B checks whether it matches with a local IIA If IIA matches with a local IIA Then B checks the hash contained in the Approval Response If hash is equal to B's hash for the specified iia id Then B saves Dashboard's approval
At Dashboard's IIAs database `a.iia_id` | … | `a.hash_2` | `b.iia_id` | `b.hash_2` **At Dashboard's Approvals database** `a.iia_id` | `A` | `b.hash_2` | …		**At B's IIAs database** `b.iia_id` | … | `b.hash_2` | `a.iia_id` | `a.hash_2` **At B's Approvals database** `b.iia_id` | `A` | `b.hash_2` | …

		Given that Dashboard and B have exchanged their IIA Ids And B has the latest version of Dashboard's hash When B wants to approve an IIA Then B sends an IIA Approval CNR to Dashboard And B waits for an IIA Approval CNR Response
When Dashboard receives an IIA Approval CNR from B **Then** Dashboard sends an IIA Approval CNR Empty Response to B **And** Dashboard sends an IIA Approval Request to B **And** Dashboard waits for a response to the IIA Approval Request	← IIA Approval CNR: approving_hei=b,owner_hei=a,iia_id=a.iia_id IIA Approval CNR Empty Response → IIA Approval Request: approving_hei=b,owner_hei=a,iia_id=a.iia_id →	When B receives an IIA Approval CNR Response from Dashboard Then B is sure that Dashboard received the IIA Approval CNR
When Dashboard receives the Ex 6 IIA Approval Response **Then** Dashboard checks whether it matches with a local IIA **If** IIA matches with a local IIA **Then** Dashboard checks the hash contained in the Approval Response **If** hash is equal to Dashboard's hash for the specified iia id **Then** Dashboard saves B's approval	←Ex 6 IIA Approval Response	When B receives an IIA Approval Request from Dashboard Then B searches for the IIA with partner's id a.iia_id If IIA is approved in B Then B prepares the IIA Approval Response # The response contains the latest Dashboard's hash that B knows (a.hash_2) And B sends the IIA Approval Response (Ex 6) to Dashboard

At A's IIAs database

a.iia_id	…	a.hash_2	b.iia_id	b.hash_2

At Dashboard's Approvals database

a.iia_id	A	b.hash_2	…
a.iia_id	B	a.hash_2	…

At B's IIAs database

b.iia_id	…	b.hash_2	a.iia_id	a.hash_2

At B's Approvals database

b.iia_id	A	b.hash_2	…
b.iia_id	B	a.hash_2	…

Notice that:

3) An IIA is approved by both parties only when both partners have shared their approvals complying to the procedure above.
4) Each partner sends the hash of the other partner, as partners may not calculate the same hash for the same iia conditions. As such, each partner should have previously shared the latest hash that was calculated in its system.
5) It is not a good practice for partners to scan the network for approvals.

SECTION 4 – IIA CNR AFTER APPROVAL (CHANGES IN COOPERATION CONDITIONS)

HEI A: EWP Dashboard		HEI B
At Dashboard's IIAs database a.iia_id | … | a.hash_2 | b.iia_id | b.hash_2 **At Dashboard's Approvals database** a.iia_id | A | b.hash_2 | …		**At B's IIAs database** b.iia_id | … | b.hash_2 | a.iia_id | a.hash_2 **At B's Approvals database** b.iia_id | A | b.hash_2 | …
		Given that one of the two partners has approved the IIA And B wants to make changes to the cooperation conditions of the IIA When B makes changes in the IIA Then B sends an IIA CNR to Dashboard And B waits for an IIA CNR Response
	←notifier_hei=b,iia_id=b.iia_id: IIA CNR	
When Dashboard receives an IIA CNR from B Then Dashboard sends an IIA CNR Empty Response to B	IIA CNR Empty Response →	

And Dashboard sends an IIA GET Request to B And Dashboard waits for a response to the IIA GET request	IIA GET Request: hei_id=b,iia_id=b.iia_id → ←Ex 7 IIA GET Response	When B receives an IIA CNR Response from Dashboard Then B is sure that Dashboard received the IIA CNR When B receives an IIA GET Request from Dashboard Then B searches for the IIA with id b.iia_id And B prepares the IIA GET Response # The response contains the hash of the cooperation conditions recalculated by B (b.hash_3) And B sends the IIA GET Response (Ex 7) to Dashboard
When Dashboard receives the Ex 7 IIA GET Response Then Dashboard checks whether IIA Response is valid If IIA is valid Then Dashboard checks whether it matches with a local IIA If IIA matches with a local IIA Then Dashboard checks if B made changes If B changed the IIA Then Dashboard updates B's hash in its local IIA Then Dashboard saves the changes in its local IIA Then Dashboard recalculates its local IIA hash		
At A's IIAs database		**At B's IIAs database**

a.iia_id | … | a.hash_3 | b.iia_id | b.hash_3		b.iia_id | … | b.hash_3 | a.iia_id | a.hash_2
At Dashboard's Approvals database ~~a.iia_id~~ | ~~A~~ | ~~b.hash_2~~ | …		**At B's Approvals database** ~~b.iia_id~~ | ~~A~~ | ~~b.hash_2~~ | …
Given that Dashboard's local IIA hash changed Then Dashboard sends an IIA CNR to B And Dashboard waits for an IIA CNR Response	IIA CNR: notifier_hei=a,iia_id=a.iia_id →	
		When B receives an IIA CNR from Dashboard Then B sends an IIA CNR Empty Response to Dashboard And B sends an IIA GET Request to Dashboard And B waits for a response to the IIA GET Request
When Dashboard receives an IIA CNR Response from B Then Dashboard is sure that B received the IIA CNR	←IIA CNR Empty Response ←IIA GET Request: hei_id=a,iia_id=a.iia_id	
When Dashboard receives an IIA GET Request from B Then Dashboard searches for the IIA with id a.iia_id And Dashboard prepares the IIA GET Response # The response contains the hash of the cooperation conditions calculated by A (a.hash_3) And Dashboard sends the IIA GET Response (Ex 8) to B	Ex 8 IIA GET Response →	When B receives the Ex 8 IIA GET Response Then B checks whether IIA Response is valid If IIA is valid Then B checks whether it matches with a local IIA

<table>
<tr><td></td><td></td><td>If IIA matches with a local IIA
Then B checks if Dashboard made changes
If Dashboard changed the IIA
Then B updated Dashboard's hash in its local IIA
Then B saves the changes in its local IIA
Then B recalculates its local IIA hash</td></tr>
<tr><td>At A's IIAs database
<table><tr><td>a.iia_id</td><td>…</td><td>a.hash_3</td><td>b.iia_id</td><td>b.hash_3</td></tr></table>
At Dashboard's Approvals database
<table><tr><td><s>a.iia_id</s></td><td><s>A</s></td><td><s>b.hash_2</s></td><td><s>…</s></td></tr></table></td><td></td><td>At B's IIAs database
<table><tr><td>b.iia_id</td><td>…</td><td>b.hash_3</td><td>a.iia_id</td><td>a.hash_3</td></tr></table>
At B's Approvals database
<table><tr><td><s>b.iia_id</s></td><td><s>A</s></td><td><s>b.hash_2</s></td><td><s>…</s></td></tr></table></td></tr>
</table>

Notice that:

6) A partner may make changes to an IIA even after one partner approved it.
7) After changes in the IIA, the approval is not valid and should be exchanged again with the latest hashes.
8) Again, in this scenario, Dashboard made a new IIA CNR in order to tell B about its new hash.
9) If the hashes are the same, the changes should be simply processed with no effect in the approvals whatsoever.

EXAMPLES

Ex 1

```
<iias-get-response>
    <iia>
        <partner>
            <hei-id>A</hei-id>
            <iia-id>a.iia_id</iia-id>
            <iia-id>a.code</iia-id>
            <!-- ...-->
        </partner>
        <partner>
            <hei-id>B</hei-id>
        </partner>
        <cooperation-conditions>
            <student-studies-mobility-spec>
                <sending-hei-id>Dashboard Hei</sending-hei-id>
                <receiving-hei-id>B</receiving-hei-id>
                <receiving-academic-year-id>2023/2024</receiving-academic-year-id>
                <mobilities-per-year>2</mobilities-per-year>
                <recommended-language-skill>
                    <language>en</language>
```

```
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <subject-area>
                    <isced-f-code>0314</isced-f-code>
                </subject-area>
                <total-months-per-year>5</total-months-per-year>
                <blended>false</blended>
                <eqf-level>7</eqf-level>
                <eqf-level>8</eqf-level>
            </student-studies-mobility-spec>
        </cooperation-conditions>
        <conditions-hash>a.hash_1</conditions-hash>
    </iia>
</iias-get-response>
```

Ex 2

```
<iias-get-response>
    <iia>
        <partner>
            <hei-id>B</hei-id>
            <iia-id>b.iia_id</iia-id>
            <iia-id>b.code</iia-id>
                        <!-- ...-->
```

```
        </partner>
        <partner>
            <hei-id>A</hei-id>
            <iia-id>a.iia_id</iia-id>
            <iia-id>a.code</iia-id>
                                <!-- ...-->
        </partner>
        <cooperation-conditions>
            <student-studies-mobility-spec>
                <sending-hei-id>A</sending-hei-id>
                <receiving-hei-id>B</receiving-hei-id>
                <receiving-academic-year-id>2023/2024</receiving-academic-year-id>
                <mobilities-per-year>2</mobilities-per-year>
                <recommended-language-skill>
                    <language>en</language>
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <subject-area>
                    <isced-f-code>0314</isced-f-code>
                </subject-area>
                <total-months-per-year>5</total-months-per-year>
                <blended>false</blended>
                <eqf-level>7</eqf-level>
                <eqf-level>8</eqf-level>
            </student-studies-mobility-spec>
```

```
        </cooperation-conditions>
        <conditions-hash>b.hash_1</conditions-hash>
    </iia>
</iias-get-response>
```

Ex 3

```
<iias-get-response>
    <iia>
        <partner>
            <hei-id>A</hei-id>
            <iia-id>a.iia_id</iia-id>
            <iia-id>a.code</iia-id>
            <!-- ...-->
        </partner>
        <partner>
            <hei-id>B</hei-id>
            <iia-id>b.iia_id</iia-id>
            <iia-id>b.code</iia-id>
            <!-- ...-->
        </partner>
        <cooperation-conditions>
            <student-studies-mobility-spec>
                <sending-hei-id>A</sending-hei-id>
```

```
                <receiving-hei-id>B</receiving-hei-id>
                <receiving-academic-year-id>2023/2024</receiving-academic-year-id>
                <mobilities-per-year>4</mobilities-per-year>
                <recommended-language-skill>
                    <language>en</language>
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <subject-area>
                    <isced-f-code>0314</isced-f-code>
                </subject-area>
                <total-months-per-year>5</total-months-per-year>
                <blended>false</blended>
                <eqf-level>7</eqf-level>
                <eqf-level>8</eqf-level>
            </student-studies-mobility-spec>
        </cooperation-conditions>
        <conditions-hash>a.hash_2</conditions-hash>
    </iia>
</iias-get-response>
```

Ex 4

```
<iias-get-response>
    <iia>
        <partner>
            <hei-id>B</hei-id>
            <iia-id>b.iia_id</iia-id>
            <iia-id>b.code</iia-id>
                                <!-- ...-->
        </partner>
        <partner>
            <hei-id>A</hei-id>
            <iia-id>a.iia_id</iia-id>
            <iia-id>a.code</iia-id>
                                <!-- ...-->
        </partner>
        <cooperation-conditions>
            <student-studies-mobility-spec>
                <sending-hei-id>A</sending-hei-id>
                <receiving-hei-id>B</receiving-hei-id>
                <receiving-academic-year-id>2023/2024</receiving-academic-year-id>
                <mobilities-per-year>4</mobilities-per-year>
                <recommended-language-skill>
                    <language>en</language>
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <subject-area>
```

```
                    <isced-f-code>0314</isced-f-code>
                </subject-area>
                <total-months-per-year>5</total-months-per-year>
                <blended>false</blended>
                <eqf-level>7</eqf-level>
                <eqf-level>8</eqf-level>
            </student-studies-mobility-spec>
        </cooperation-conditions>
        <conditions-hash>b.hash_2</conditions-hash>
    </iia>
</iias-get-response>
```

Ex 5

```
<iias-approval-response>
    <approval>
        <iia-id>b.iia_id</iia-id>
        <conditions-hash>b.hash_2</conditions-hash>
    </approval>
</iias-approval-response>
```

Ex 6

```
<iias-approval-response>
    <approval>
        <iia-id>a.iia_id</iia-id>
        <conditions-hash>a.hash_2</conditions-hash>
    </approval>
</iias-approval-response>
```

Ex 7

```
<iias-get-response>
    <iia>
        <partner>
            <hei-id>B</hei-id>
            <iia-id>b.iia_id</iia-id>
            <iia-id>b.code</iia-id>
            <!-- ...-->
        </partner>
        <partner>
```

```
            <hei-id>A</hei-id>
            <iia-id>a.iia_id</iia-id>
            <iia-id>a.code</iia-id>
            <!-- ...-->
        </partner>
        <cooperation-conditions>
            <student-studies-mobility-spec>
                <sending-hei-id>A</sending-hei-id>
                <receiving-hei-id>B</receiving-hei-id>
                <receiving-academic-year-id>2023/2024</receiving-academic-year-id>
                <mobilities-per-year>4</mobilities-per-year>
                <recommended-language-skill>
                    <language>en</language>
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <recommended-language-skill>
                    <language>en</language>
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <subject-area>
                    <isced-f-code>0314</isced-f-code>
                </subject-area>
                <total-months-per-year>6</total-months-per-year>
                <blended>false</blended>
                <eqf-level>7</eqf-level>
```

```
                <eqf-level>8</eqf-level>
            </student-studies-mobility-spec>
        </cooperation-conditions>
        <conditions-hash>b.hash_3</conditions-hash>
    </iia>
</iias-get-response>
```

Ex 8

```
<iias-get-response>
    <iia>
        <partner>
            <hei-id>A</hei-id>
            <iia-id>a.iia_id</iia-id>
            <iia-id>a.code</iia-id>
            <!-- ...-->
        </partner>
        <partner>
            <hei-id>B</hei-id>
```

```
            <iia-id>b.iia_id</iia-id>
            <iia-id>b.code</iia-id>
            <!-- ...-->
        </partner>
        <cooperation-conditions>
            <student-studies-mobility-spec>
                <sending-hei-id>A</sending-hei-id>
                <receiving-hei-id>B</receiving-hei-id>
                <receiving-academic-year-id>2023/2024</receiving-academic-year-id>
                <mobilities-per-year>4</mobilities-per-year>
                <recommended-language-skill>
                    <language>en</language>
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <recommended-language-skill>
                    <language>en</language>
                    <cefr-level>B1</cefr-level>
                </recommended-language-skill>
                <subject-area>
                    <isced-f-code>0314</isced-f-code>
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                <total-months-per-year>6</total-months-per-year>
                <blended>false</blended>
                <eqf-level>7</eqf-level>
                <eqf-level>8</eqf-level>
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            </student-studies-mobility-spec>
        </cooperation-conditions>
        <conditions-hash>a.hash_3</conditions-hash>
    </iia>
</iias-get-response>
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