WIS Monitoring

GISC Beijing/CMA

2014.11

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Monitoring is Requirements for WIS Centres

WMO No. 1060 "Manual on WIS" (2012 edition, updated 2013)

3.5 **Functional requirements of a GISC**
3.5.10 ***Performance monitoring of a GISC***
3.5.10.1 Each GISC shall participate in monitoring the performance of WIS, including monitoring the collection and distribution of data and products intended for global exchange. Each GISC shall report routinely to other GISCs, as well as to the WMO Secretariat, information concerning the status and performance of connectivity to WIS centres in its area, including capacity and technology used (for example, the Internet, satellite-based data distribution and dedicated data networks). CBS shall review and report on the status and performance of GISCs with the assistance of the WMO Secretariat.
3.5.10.2 Monitoring of the collection and dissemination of WIS information (data and products) should include, as appropriate, WIS monitoring and monitoring related to WMO Programmes.
3.5.10.3 See also 4.16, WIS-TechSpec-15 (Reporting of quality of service).

3.6 **Functional requirements of a DCPC**
3.6.10 ***Performance monitoring of a DCPC***
3.6.10.1 Each DCPC shall participate in monitoring the performance of WIS.
3.6.10.2 See also 4.16, WIS-TechSpec-15 (Reporting of quality of service).

3.7 **Functional requirements of an NC**
3.7.5 ***Performance monitoring of an NC***
3.7.5.1 As required per the *Technical Regulations* (WMO-No. 49), Volume I, Part I, section 3, each NC shall participate in monitoring the performance of WIS.
3.7.5.2 See also 4.16, WIS-TechSpec-15 (Reporting of quality of service).

4.16 **WIS-TechSpec-15: Reporting of quality of service**
4.16.1 This specification requires that reporting of quality of service shall be represented and communicated as prescribed by the host of the centralized reporting database.
4.16.2 Reports should be sent on a schedule determined by the centralized reporting manager, based on the needs of WIS centres.
4.16.3 See also 3.5.7 (Network connectivity of GISC), 3.5.8 (Coordinate telecommunications in the GISC area), 3.5.9 (Recovery arrangements of GISC), 3.5.10 (Performance monitoring of a GISC), 3.6.9 (Recovery arrangements of a DCPC) and 3.6.10 (Performance monitoring of a DCPC).

ET-WISC Workshop on Monitoring

WIS Monitoring Workshop, 21-24, Jan. 2014, Geneva

Chaired by Leonid Bezrouk (GISC Moscow)

http://wis.wmo.int/page=WIS-Work-Mon-2014

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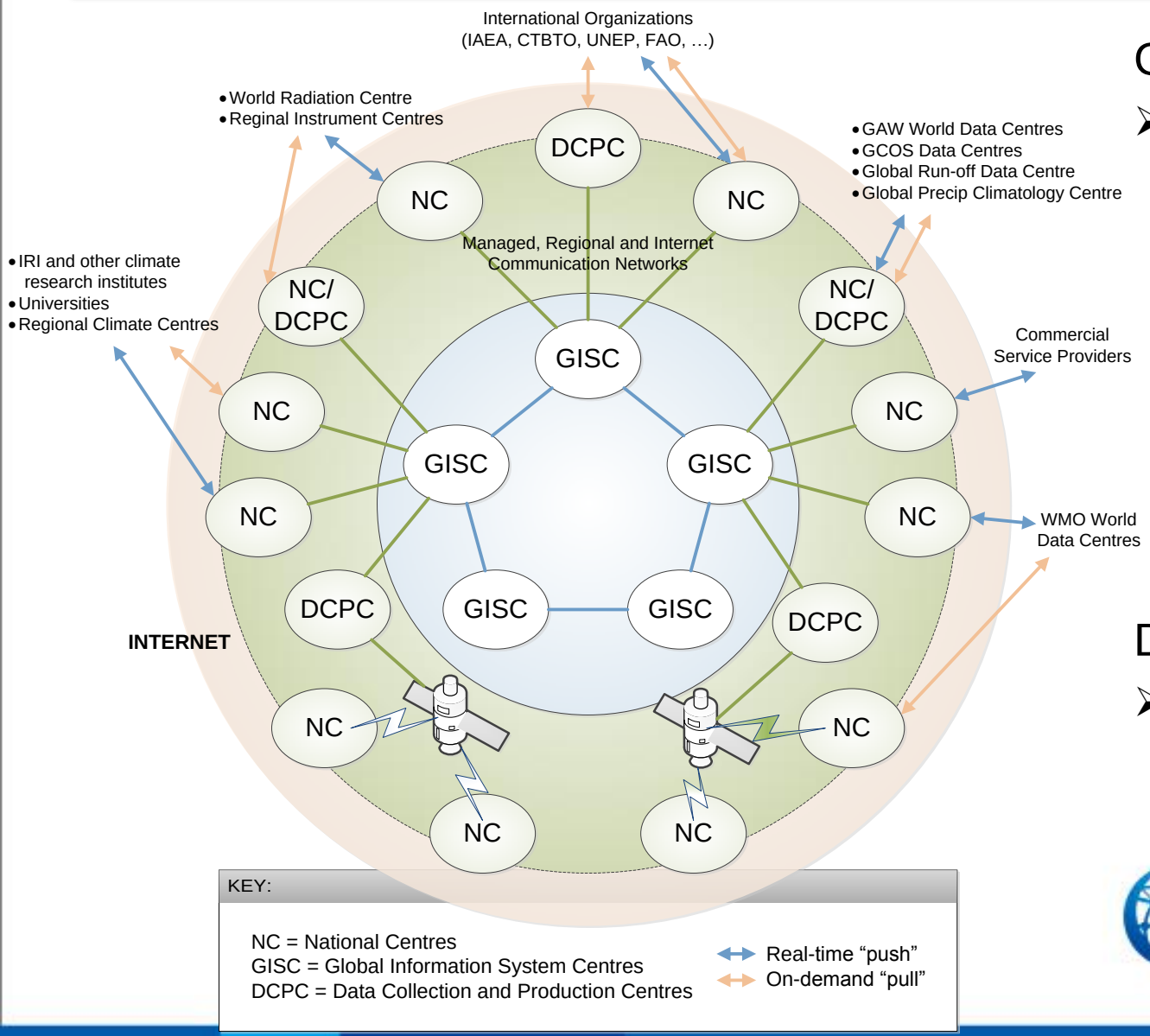
Reporting of “Quality of Service”



GISC shall:

- report routinely to other GISCs & WMO Secretariat, information concerning the status and performance of connectivity to WIS centres in its AoR.

DCPC/NC shall:

- provide operations monitoring information to principal GISC.

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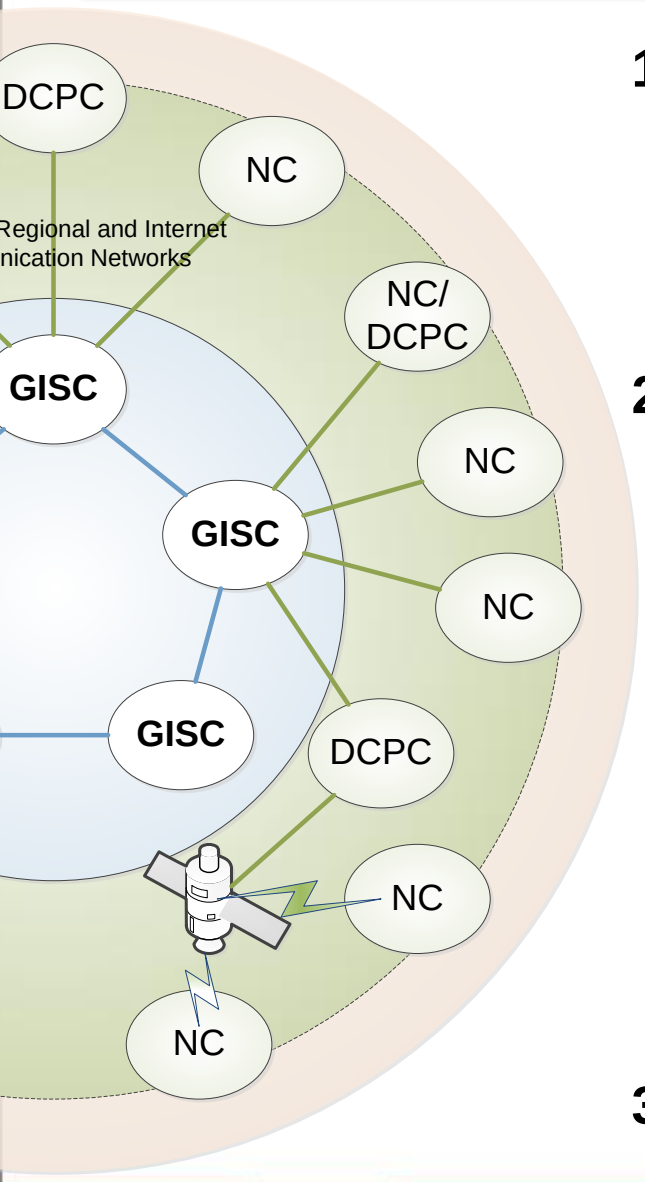
GISC Monitoring Requirements



1. **Real-time operations monitoring**

   continuously monitor in real-time items covering the GISC's area of responsibility

2. **Quarterly Reporting**

   a) Service Performance;

   b) Operational Infrastructure Performance;

   c) Operational Anomalies and Incidents;

   d) Evolutions/Upgrades Carried Out During the Reporting Period;

   e) Planned Evolutions/Upgrades;

   f) User Service Statistics.

3. **Incident Reporting**

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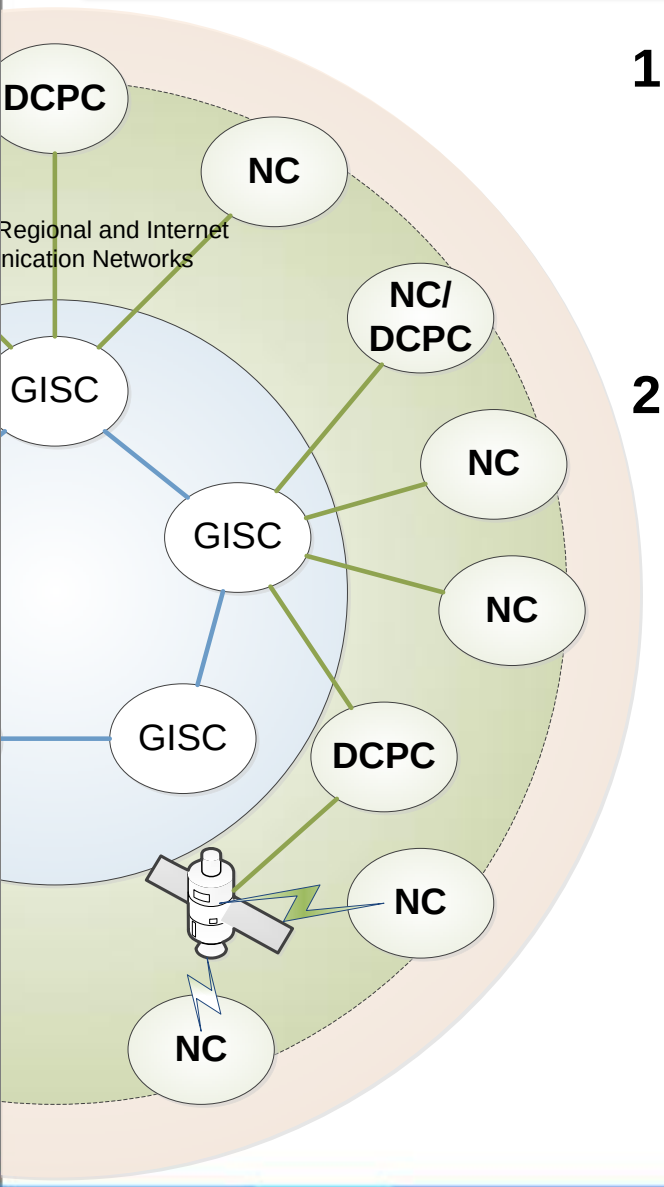
DCPC/NC Monitoring Requirements



1. **Real-time operations monitoring**

   continuously provide monitoring information in real-time to the “principle GISC”

2. **Quarterly Reporting**

   provide information to the “principal GISC”, synchronised with the quarterly reporting cycle

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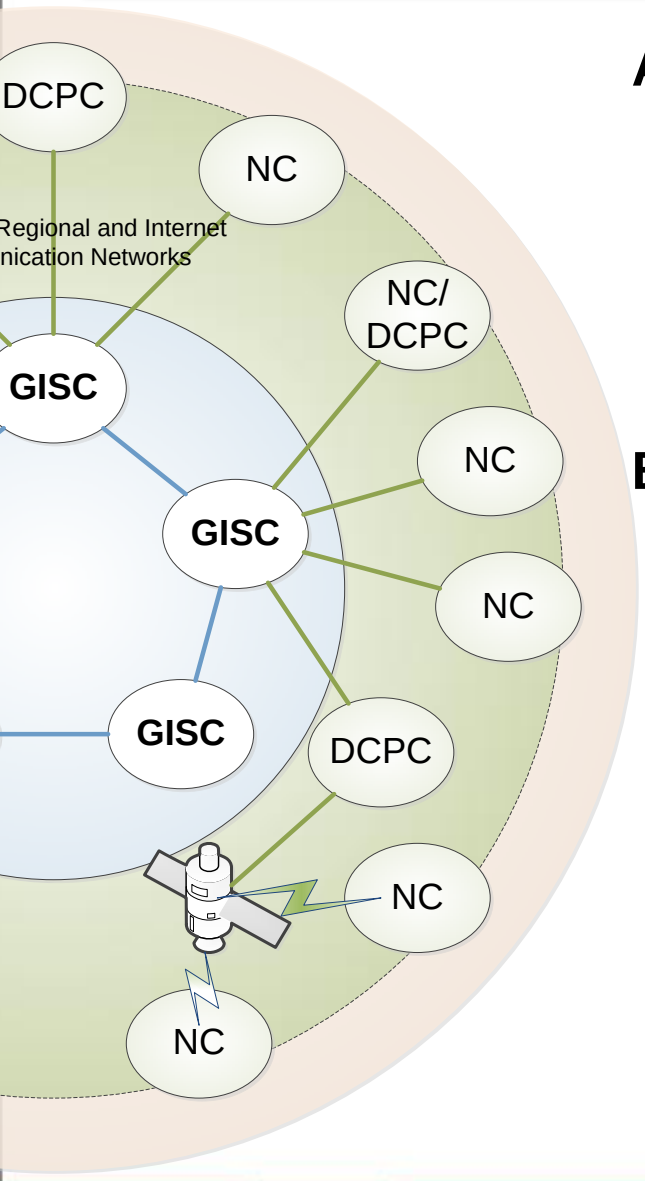
GISC Real-time Operations Monitoring



A. Covering GISC's Area of Responsibility

- Real-time monitoring information of GISC itself
- Real-time monitoring information of DCPC & NC within the GISC's area of responsibility

B. Dashboard:

a) Status information;

b) Graphical information;

c) Schematic information;

d) Exchanged in real-time with all GISCs;

e) Provide to single centralised WIS dashboard

f) Support "drill-down" capability.

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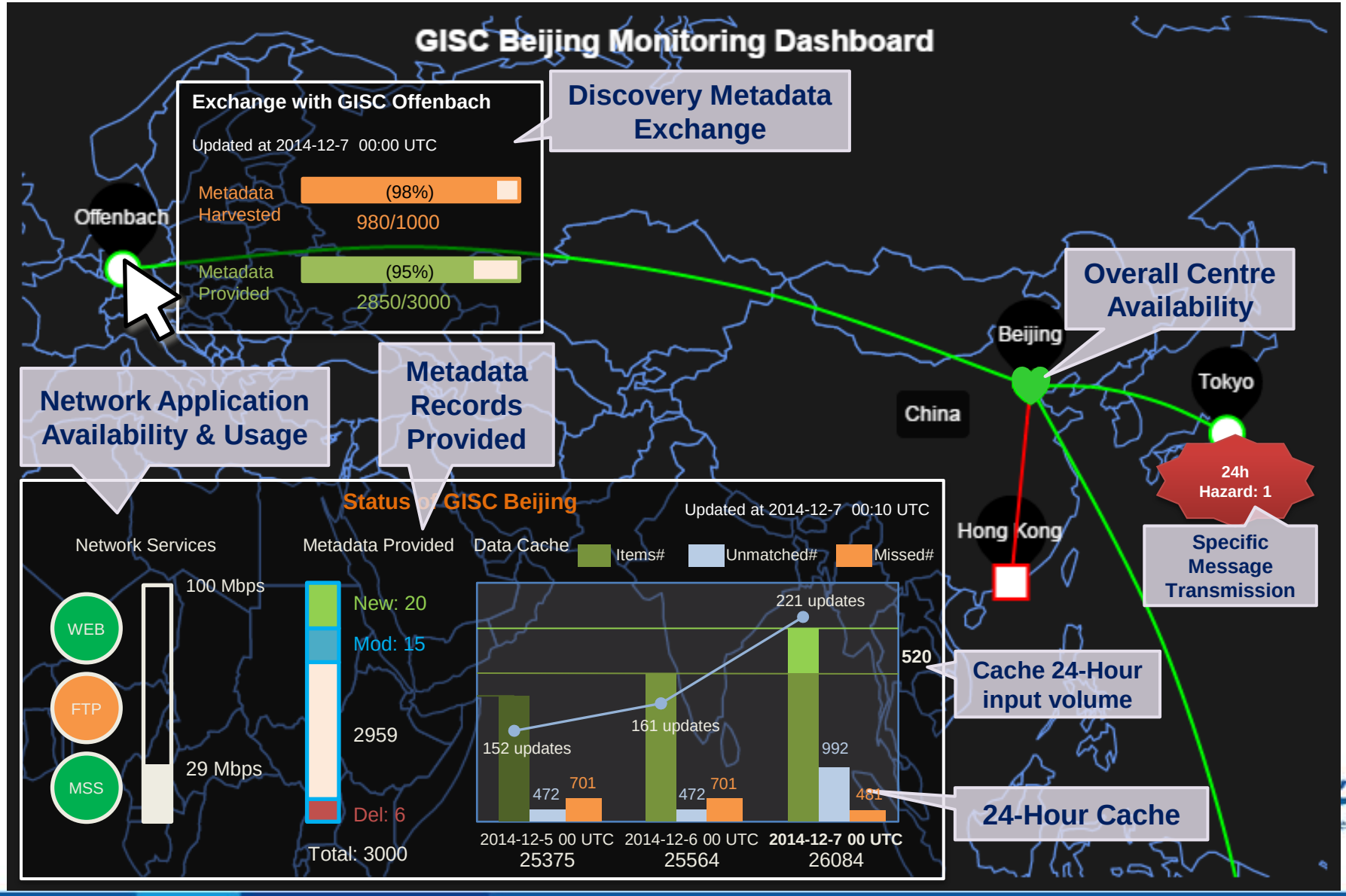
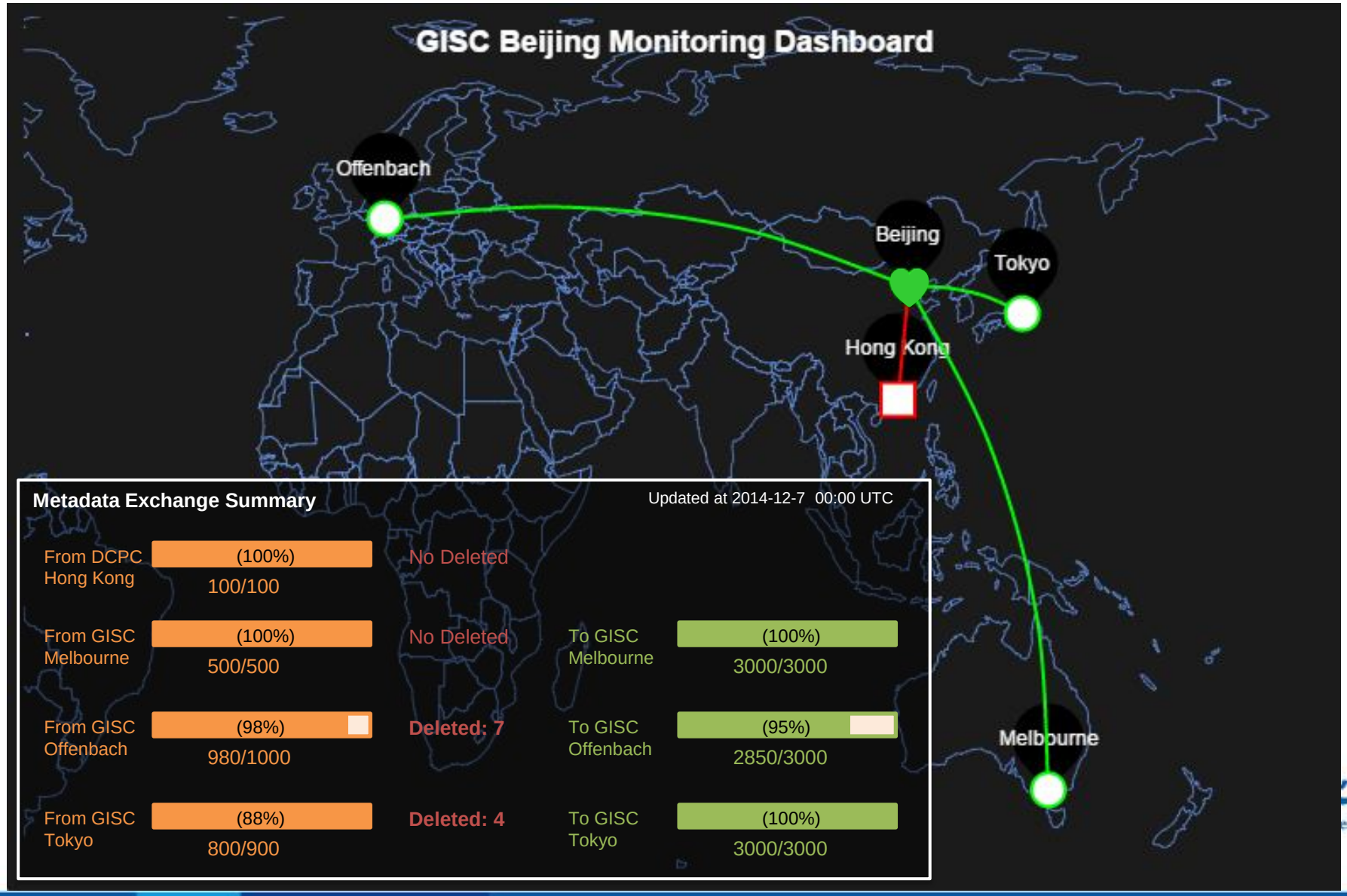
Dashboard (one simple mockup)



Dashboard (one simple mockup)



Real-time Monitoring (GISC vs. DCPC/NC)

GISC:

1) Overall Centre Availability;
2) Network Usage;
3) Application Flows;
4) Network Application Availability;
5) Server Performance;
6) Discovery Metadata Exchange;
7) Data and Products;
8) 24-Hour Cache;
9) Specific Message Transmission Monitoring.

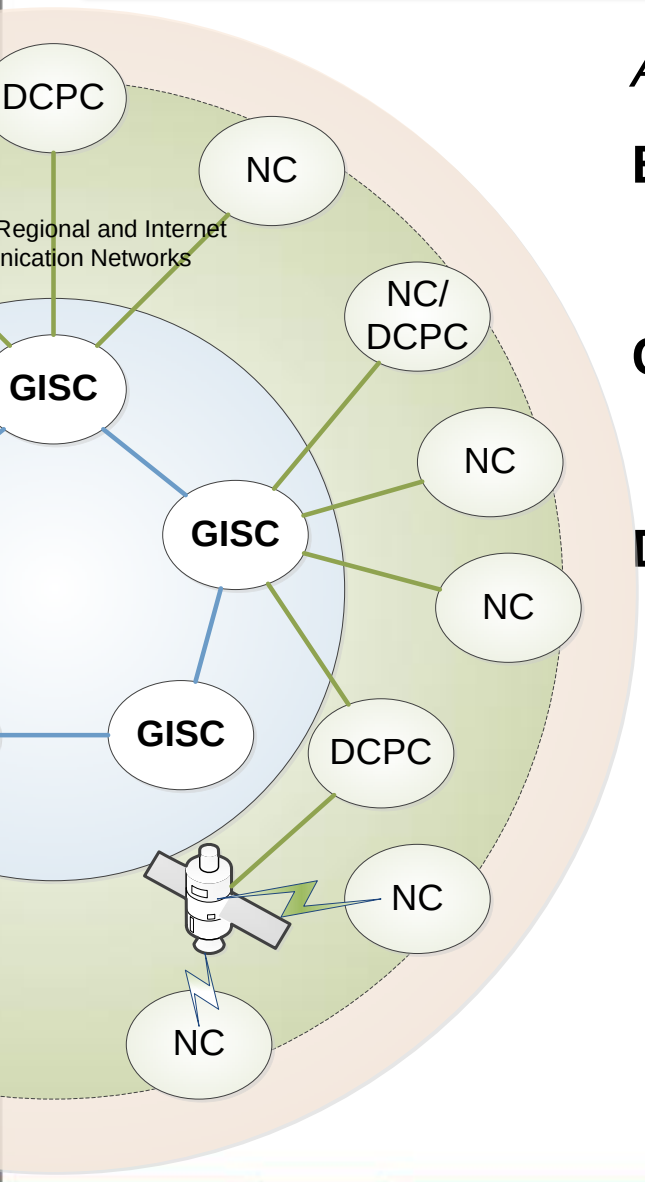
(approach currently under consolidation)

DCPC/NC:

1) Overall Centre Availability;
2) Network Application Availability;
3) Specific Message Transmission Monitoring.

(approach currently under consolidation)

GISC Incident Reporting



A. Covering GISC's Area of Responsibility ?

B. For operational anomalies or incidents that have a significant detrimental impact

C. Prepared and provided to WMO Secretariat

D. Contents:

a) Circumstances of the incident;

nature, timeline, impact on services and operational infrastructure, recovery measures, impact on other centres

b) root cause analysis;

c) measures adopted to avoid a repeat of Incident.

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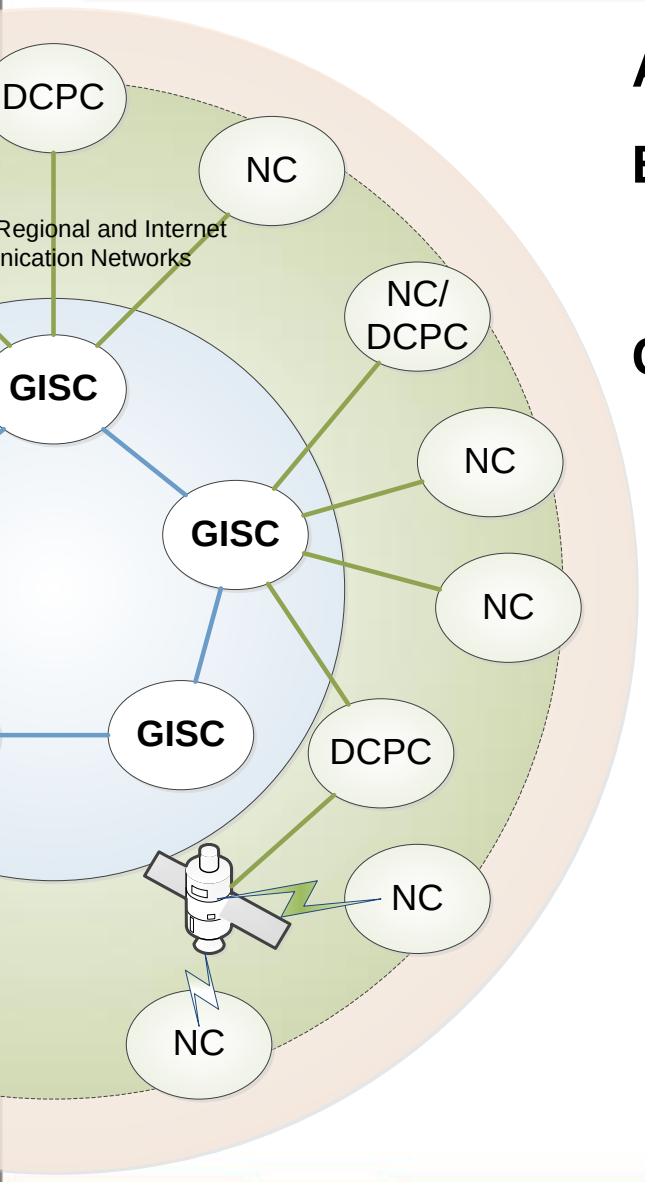
GISC Quarterly Reporting (4 times / year)



A. Covering GISC's Area of Responsibility

B. Provided to WMO Secretariat within 6 weeks from the end of the reporting period

C. Contents:

a) Service Performance;

b) Operational Infrastructure Performance;

Statistics derived from Real-time Monitoring

c) Operational Anomalies and Incidents;

Summary Incident Report

d) Evolutions/Upgrades Carried Out During the Reporting Period;

e) Planned Evolutions/Upgrades;

f) User Service Statistics.

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Quarterly Reporting (GISC vs. DCPC/NC)

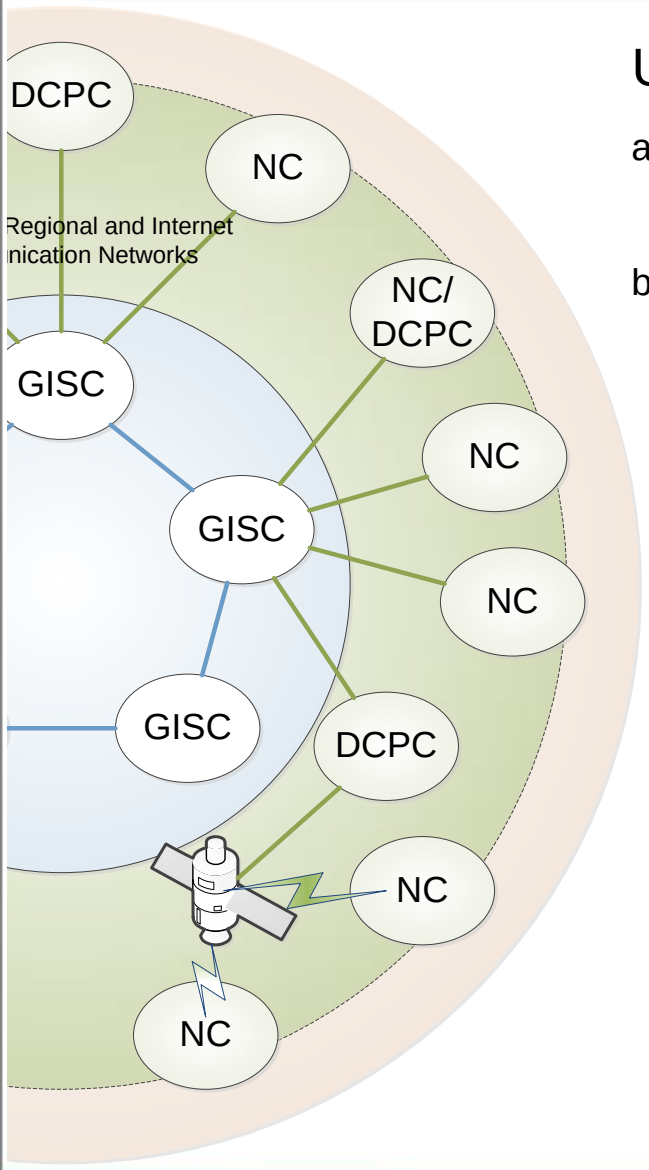
GISC:

1) Service Performance;
2) Operational Infrastructure Performance;
3) Operational Anomalies and Incidents;
4) Evolutions/Upgrades Carried Out During the Reporting Period;
5) Planned Evolutions/Upgrades;
6) User Service Statistics.

DCPC/NC:

1) Availability of metadata for all products;
2) User Service Statistics.

User Service Statistics



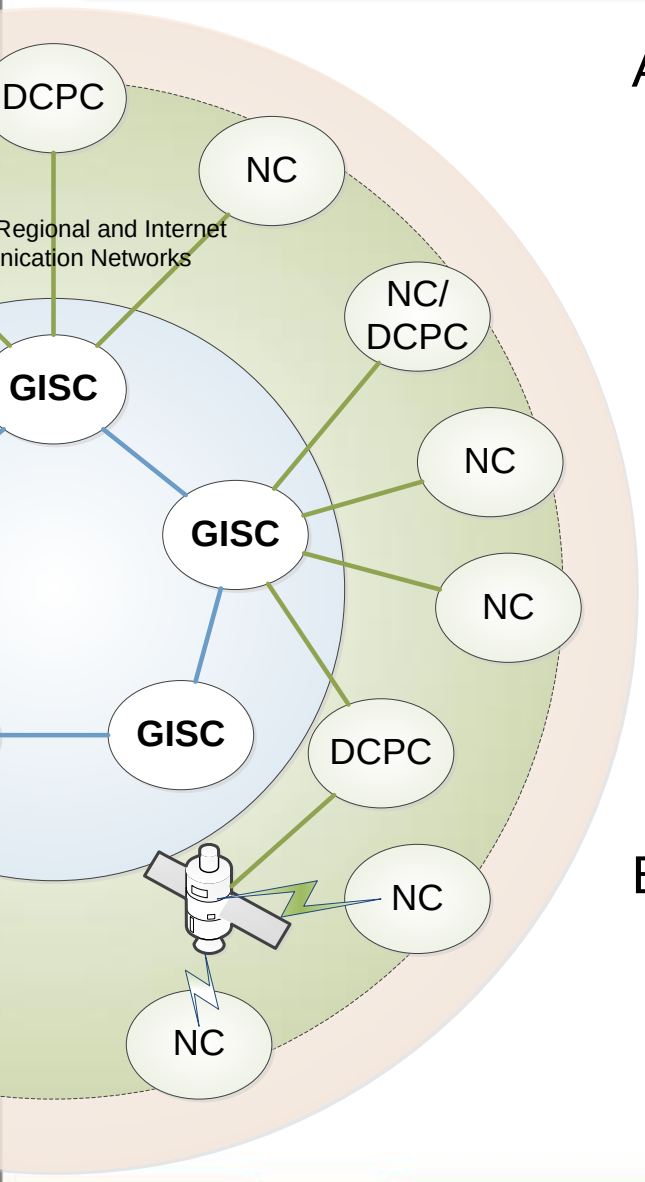
User Service Statistics is to:

a) Summarise the main features of the user community that is served by the GISC and its area of responsibility;

b) Summarise the performance of the helpdesk function (provided by the GISC).

1) Number of User Registrations;
2) Type of User;
3) Number of "Dormant" Users;
4) Location (countries) of Users;
5) Type of data accessed;
6) Amount of NRT and off-line data requests
7) Number of User Queries;
8) Type of User Queries;
9) Mean Time to Closure of User Queries;
10) User Satisfaction (by survey / feedback).

Exchange of Real-time Monitoring Info.



A. By **GISC Dashboard ?**

Dashboard is:

- Graphical User Interface (GUI),
- Limited to human-eye reading,
- Limited to GISC web page,
- Difficult to be exchanged, read by program,
- Difficult to be integrated by single centralised WIS dashboard.

B. By **Formatted Monitoring Message**

- Message Exchange Interface/Protocol
- Message Format
- Message Content

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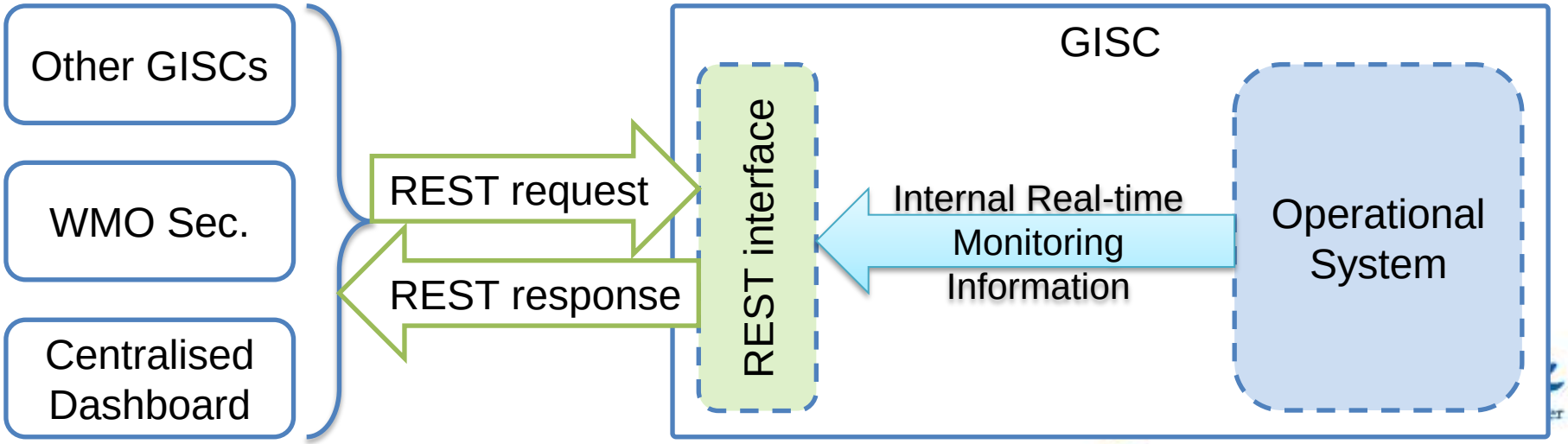
REST: Interface/Protocol of Exchange

REST is:

- Representational state transfer (REST)
- one of interfaces of Web Services
- based on URI & HTTP protocol

Providing real-time monitoring message



Real-time Monitoring Request (via REST)

Request: https://wisportal.cma.gov.cn/monitor/status /metadata
/cache
/cache/input
…

request root

request category

Request Category Level 1
1. Overall Centre Availability
2. Network Usage
3. Application Flows
4. Network Application Availability
5. Server Performance
6. Discovery Metadata Exchange
7. Data and Products
8. 24-Hour Cache
9. Specific Message Transmission Monitoring

	Request Category Level 2
Discovery Metadata Exchange	a) No. of failed and successful connection attempts reported by each GISC and Centre
	b) No. of new, modified or deleted records
	c) No of records held at 00:00UTC
	d) No. of data records received with no metadata between 00:00UTC and 23:59 UTC

	Request Category Level 2
24-Hour Cache	a) Cache updates in the last 24 Hrs
	b) 24 Hrs input volume of cache
	c) Number of items in cache
	d) Core cache updates in the last 24 Hrs
	e) 24 Hrs input volume of core cache
	f) Number of items in core cache

Real-time Monitoring Request (via REST)

REST query URI:

https://wisportal.cma.gov.cn/

monitor/status/overall [? username=GISCTokyo & interval=24H]

Request URI parameters:

Element	Required?	Data type	Default	Note/Example
Request category	Y	String	/overall	/overall /metadata /metadata/update /cache /cache/input
Interface Version	N	String	Latest	
Sampling timestamp	N	ISO 8601	Latest	2014-12-23T01:05:10Z
Interval	N	ISO 8601	24H	P24H
Begin time of interval	N	ISO 8601	00:00 ~ 23:59, last day UTC	2014-3-23T00Z
Username	N	String	Anonymous	

Real-time Monitoring Response (via REST)

Request: https://wisportal.cma.gov.cn/monitor/status/overall

Response header:

Element	Required?	Data type	Note/Example
Centre	Y	String	
Request timestamp	Y	ISO 8601	
Request category	Y	String	
Version	Y	String	
Interval	Y	ISO 8601	P24H
Begin time of interval	Y	ISO 8601	2014-12-23T00Z

JSON format message:

```
{
    "centre": "gisc-beijing",
    "request-timestamp": "2014-03-23T00:05:25Z",
    "request-category": "/overall",
    "version": "0.1",
    "sampling-timestamp": "2014-03-23T00:03:10Z"
    "interval": "P24H",
    "begin-time-of-interval", "2014-03-23T00Z",
    "overall": {
        ...
    }
}
```

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Providing details according request levels

Request: https://wisportal.cma.gov.cn/monitor/status /metadata

Response:

request category L1

```
{
    [header],
    ...,
    "metadata": {
        "number_of_records": 3000,
        "number_of_user_access": 462,
        "number_of_user_follow_link": 274,
        ...
    }
}
```

Request: https://wisportal.cma.gov.cn/monitor/status /metadata/update

Response:

request category L2

```
{
    [header],
    ...,
    "metadata-update": {
        "number_of_new_records": 20,
        "number_of_modified_records": 15,
        "number_of_deleted_records": 6,
        ...
    }
}
```

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Advantages of Levelled Request URI

By using levelled request URI, Monitoring interface can:

- Provide details according to request (including requester)
- Implement categories separately (step by step)
- Authorize according to request + requester
- Extend and upgrade easily

Unspecified details …

For exchange among centres,

Parameter names and meanings of Request URI and Response JSON

- Lexical & Grammatical specification
- Semantic specification

Example: parameter names of “Discovery Metadata Exchange” / “No. of metadata records provided”?

Centre A: `no_of_metadata_records_provided`, within metadata response including deleted metadata records

Centre B: `metadata_numbers`, within overall response not including deleted metadata records

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need “Monitoring Exchange Specification”

Negotiate and consolidate the specification. Some spec describing (eg.):

Element	Required?	Data type	Meaning/Explanation
Sampling timestamp	Y	ISO 8601	
Interval	Y	ISO 8601	
Begin time of interval	Y	ISO 8601	
Update times#	Y	Integer	
Failure times#	N	Integer	
Hit times#	N	Integer	
Miss times#	N	Integer	
Items# in cache (after updates)	Y	Integer	
Bytes# in cache (after updates)	N	Integer	
Items# in cache w/ metadata (after updates)	N	Integer	
Items# in cache w/o metadata (after updates)	N	Integer	
Input items#	Y	Integer	
Input data bytes	N	Integer	
Input items# w/ metadata	Y	Integer	
Input items# w/o metadata	N	Integer	

Thanks for Listening !

Q & A

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