ISO/IEC JTC 1/SC 38 "Cloud Computing and Distributed Platforms"
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Description

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BUSINESS PLAN FOR JTC 1/SC 38

Cloud Computing and Distributed Platforms

Period covered: October 2021 – August 2022

1 Executive Summary

Holding its first meeting in May 2010, SC 38 was chartered at the November 2009 JTC 1 Plenary to work on Distributed Application Platforms and Services (DAPS) including Cloud Computing and the related facilitating technologies of Web Services and Service Oriented Architecture (SOA).

Upon completion of its work on Web Services and SOA, and on publishing the foundational Cloud Computing standards on Cloud Computing vocabulary, concepts and reference architecture, SC 38 recognized the increasing demands—especially by governments—for standards to support the specification and acquisition of Cloud Computing technologies and services. In response, SC 38 re-focused its efforts on Cloud Computing. In 2014 JTC 1 approved a revised scope and changed the title of SC 38 to "Cloud Computing and Distributed Platforms (CCDP)". The system integration nature of work on Cloud Computing and Distributed Platforms is reflected in a further revision of SC 38's scope that JTC 1 approved in 2017.

New committee leadership came on board in 2019 and with them came a concerted effort to establish long-term strategies for the committee that considers the needs of the marketplace, reflect the ongoing innovation, trends and the needs of governments and policy makers around the world in the area of Cloud Computing and Distributed Platforms. Starting in 2022, with another change in leadership there has been an effort to engage more with the relevant stakeholders in SC 38's standards and program of work. This is expected to allow SC 38 to serve the market and customers' needs in a proactive manner and educate stakeholders on SC 38's standards.

Since its inception, SC 38 has published 25 standards and is currently developing seven standards.

Participation in SC 38 continues to be robust, with involvement of 50 countries (28 P members and 22 O members).

See overview of SC 38 here.

2 Chairman's Remarks

State of Cloud Computing and Distributed Platforms

Cloud Computing and Distributed Platforms represent the most significant developments in IT technology today with substantial impact on the way IT technologies and services are provided and consumed. Cloud Computing is also driving a significant discontinuity and disruption in the marketplace, resulting in risk for some and opportunity for others. SC 38 is addressing the demand pull from users, especially governments, for standards to assist them in specifying, acquiring and applying Cloud Computing and distributed platform technologies and services.

The IT world is increasingly becoming a "cloud first" world, where applications are designed, developed and deployed using Cloud Computing technologies. This is sometimes referred to as cloud-native computing. As cloud gets more embedded amongst users, stakeholders are more focused on resiliency of cloud infrastructure, sustainability and the value of data stored in the cloud.

As we enter the 13th year of this subcommittee, we're looking further to the future to organize our efforts and prioritize what we work on to ensure it's a reflection of the state and direction of Cloud Computing. We're doing more planning and roadmap work to organize what we tackle and in what order we tackle it over the next 3-5 years. We're emphasizing the importance of seeing Cloud Computing in the larger context of what has historically been referred to as *distributed processing* or *distributed computing*. The principles of Cloud Computing that takes place in a centralized data centre, should be the same as Cloud Computing that takes place at the edge (near IoT devices). In other words, Cloud Computing and edge computing are both considered in the same continuum.

Shifting Focus

Additionally, we're shifting our focus to include more perspectives from the Cloud Service Customer (CSC) angle than the Cloud Service Provider (CSP) and Cloud Service Partner (CSN) angles. To that end SC 38 is working on a standard on key multi-cloud and federated cloud concepts. SC 38 has also initiated exploratory work in the area of digital sovereignty, as it applies to Cloud Computing in particular and distributed computing in general; trustworthiness of Cloud Computing; multi-cloud interoperability requirements; and platform capability type and Platform as a Service (PaaS).

Working Closely with Key JTC 1 SCs

We're continuing our efforts as a Systems Integration Entity to work more efficiently with the other committees that intersect more with ours. We continue to use our Liaison Coordination Group (LCG) mechanism, where NB-appointed experts join the SC 38 liaison representative, to respond on behalf of SC 38 to the target SC on issues that require SC 38 action in between our semi-annual plenary meetings. We currently have five LCGs for:

- SC 7 – Software and systems engineering
- SC 27 – Information security, cybersecurity and privacy protection
- SC 41 – Internet of Things and related technology
- SC 42 – Artificial Intelligence
- JTC 1/WG 13 – Trustworthiness

Improve Connections to Key Audiences:

We re-established AG 1 – Advisory Group for Stakeholder Engagement at our March 2022 virtual plenary. This AG is working to ensure engagement of SC 38 stakeholders in SC 38 standards and program of work. This includes, though is not limited to, engagement with customers, users, brokers, providers, advocacy groups, consultants, auditors, governments, regulators, standards development organizations (including ISO and IEC) and Open Source communities. One of the goals of this AG is to organize workshops to promote and educate on SC 38's standards and program of work, solicit input, identify gaps, encourage and grow engagement in SC 38, create informational and educational material to advertise SC 38's work, engage with and leverage work done by JTC 1/AG 1, JTC 1/AG 10, JTC 1/AG 15 and SC 38/AG 5.

- **Governments** (regulations and procurement)
    - SC 38 is expanding how we work with governments going forward, starting with closer connections to the European Commission and other governments around the world.
    - The European Commission has representatives in SC 38.
    - SC 38 experts participate in the various European activities (SWIPO, Gaia-X, etc).
    - The European Union has published the draft Data Act which references one of SC 38's standards. SC 38 is looking at how it can help better with respect to such regulatory efforts.
    - AG 1 in conjunction with the Japanese NB has organized meetings in Tokyo, Japan between SC 38 leaders and Japanese government officials to provide information on SC 38's program of work and understand Japan's standards needs for Cloud Computing and distributed platforms. This meeting will take place in September 2022 and is organized as an adjunct to the October 2022 SC 38 Plenary in Sapporo, Japan.
- **Customers**
    - As indicated above, we're shifting focus to include the CSC perspectives, aligned with this we plan to do more outreach to customers. We are open to additional liaison relationships with cloud customer organizations (e.g. OMG Cloud Working Group, COPOLCO, etc).
- **Developers**
    - Cloud computing has shifted how software development, testing and deployment are done. All

these functions are a part of what is known as “DevOps” (development and operations). In the Cloud Computing Reference Architecture (ISO/IEC 22123-3), “developer” is a sub-role of the Cloud Service Partner (CSN) role.

  - This could be approached in collaboration with ISO/ IEC JTC1 SC7/WG 29 (Agile DevOps), a new SC7 working group that was formed in July 2020. Other standards development groups may also be interested, such as IEEE where a new DevOps standard 2675 was published.
  - Topics for consideration include:
    - Sub-roles of CSN-Developers and associated activities as they develop, test, deploy and support cloud services
    - DevOps and DevSecOps cloud enabled landscape
    - Cloud native development and support
    - Cloud native development and support in multi-cloud
    - Cloud native development security considerations
    - The focus will be to help the developer community understand how to use the ISO/IEC cloud and software standards to provide and support cloud solutions that meet customer expectations.

- **JTC 1 subgroups, ISO TCs, IEC TCs and SDOs**
  - As other JTC 1 subgroups, ISO TCs and IEC TCs’ program of work intersects with Cloud Computing, we’ll expand our efforts to become aware of them and work with them more closely.
  - SC 38 chair participated in a Webinar organized by IEEE Cloud Computing Standards Committee for their Adaptive Management for Cloud Computing Study Group. The presentation introduced SC 38, its program of work and roadmap.

Long-Term Strategy

AG 5 – Long Term Standards Roadmap was established at SC 38’s September 2019 plenary in Stockholm. This group has worked on assessing trends, priorities and opportunities in the marketplace, and has provided good direction for SC 38 for the next 3-5 years. AG 5 also acts as a forum where SC 38 participants can discuss and socialize new project proposals for our program of work, and to prioritize them so we’re focusing on what is most relevant to the marketplace. This year SC 38 approved Standing Document 4 that formalizes how AG 5 identifies, reviews and socializes topics for consideration in the long-term strategy for SC 38, including items to be recommended as new items of work, and expectations around turning potential future work ideas into projects.

Here are some of findings for SC 38’s long-term direction.

- **Cloud Computing as Essential/Critical Infrastructure**
  - With millions of workers confined to their homes due to COVID-19, Cloud Computing has allowed critical industries such as online financial services, tele-health to continue despite lockdown restrictions. Furthermore, cloud-based web conferencing (for example Zoom, WebEx, Teams, etc.,) and other remote access tools have allowed most other businesses to continue operations and to replace air travel.
  - In a very real way, our global economy and daily lives now depend on these online services and the COVID-19 pandemic has merely highlighted their essential role.
  - This new awareness of the criticality of Cloud Computing has increased the number of inquiries and regulatory obligations.
  - The meaning, implication and potential impact of a “Critical Infrastructure” (CI) designation, if any, to cloud and distributed computing needs to be investigated.
- **Open Source**
  - Although, SC 38 has not engaged directly with Open Source, much of the innovation occurring in

Cloud Computing is taking place in many OSS projects (e.g. Docker, Kubernetes, etc).

- In cases where the open source projects involve interface specifications, SC 38 is open to liaison relationships with these projects and will work closely with JTC 1 as it continues its efforts around open source.

- **Multi-cloud, federated cloud and interoperability**
  - Customers are increasingly using multiple Cloud Service Providers (CSP) for variety of reasons including cost, resiliency, reliability, functionality, scaling, regulations, provider independence and quality of service, among others. SC 38 is standardizing fundamental concepts and definitions involving multi-cloud and federated cloud.
  - As customers use multiple clouds, they encounter the issues of portability, interoperability, manageability and switching. SC 38 is exploring standardization gaps, requirements and need for standards in this area.
- **Help Accountability, Attestation, Certification Ecosystem and Guidance material for MSS**
  - JTC 1 standards help enable technical-policy discussions and helps define the criteria by which industry stakeholders will be held accountable.
  - Risk-based "Management Systems Standards (MSS) such as ISO/IEC 27001/27002 (information security) and ISO/IEC 27701 (privacy add-on) contain "controls" that often require suggested, associated guidance, which often require and reference other standards. SC 38's foundational standards are thus brought in and considered critical.
  - Although at this time SC 38 itself does not have any MSS (Management System Standards) projects underway, we work with SC 27 and SC 42 and the MSS projects they develop to ensure critical SC 38 standards are referenced.
  - Through use of the Liaison Coordination Group mechanism, SC 38 works very closely with SC 27 and SC 42, especially around their MSS projects.
- **Digital Sovereignty and organizational autonomy**
  - The new European (EU) Commission that started December 1st, 2019 has "Digital Sovereignty" as a one of their main priorities. This is triggered by the global geopolitical shift given multilateralism is in decline and regions and countries feel they are increasingly on their own.
  - This trend has multiple dimensions, for example:
    - (1) Platform sovereignty
    - (2) Data sovereignty and Data Federation
  - The free flow of non-personal data regulation and its article 6 concerning cloud switching and portability is an example of such work in Europe. SC 38 will continue to focus on data portability beyond ISO/IEC 19941 to help define the landscape and come up with consensus elements needed for understanding the ramifications of data sovereignty.
  - It is expected that digital sovereignty demands will be further amplified as the result of the COVID-19 pandemic. Sovereign clouds will be in more demand as a result, given that countries would want to close borders and become more independent. Some of the aspects of digital sovereignty and organizational autonomy amplified by the pandemic are:
    - Data sovereignty and data localization, control, and sharing requirements
    - Data portability and service interchangeability requirements
    - Cloud SLAs could be affected due to the new sovereignty demands
- **Impact of COVID-19 Pandemic on Cloud and Distributed Computing Platforms**
  - COVID-19 has impacted cloud by accelerating the previously existing regulatory and political trends that had already been in motion as a result of society's increased adoption of and reliance on cloud services. Here are a few top-level COVID-19 trends and the associated policy implications that SC 38 will keep an eye on:

- Accelerated drive toward digitization across governments and society is driving continued discussions on data localization and sovereignty.
- Increased reliance on home networks and work from home arrangements has increased the need for resilient cloud infrastructure with adequate bandwidth, security, and quality.
- Accelerated application of AI and data analytics for public health has increased the focus on AI governance (fairness, explainability, privacy, and security).
- Growth of e-learning, telemedicine, e-commerce, and e-government has increased demand for cloud services, with increased regulatory attention to cloud services likely to be a trailing indicator that continues to grow over time.

2.1 Market Requirements, Innovation

Recognizing the potential of this new technology/business paradigm, consumers of IT technologies and services - especially governments - are demanding standards to assist in their transition to Cloud Computing. Responding to these demands, in 2014 JTC 1 approved SC 38's change in scope and title: To support the application of Cloud Computing and Distributed Platforms standards across JTC 1, IEC, ISO and other standards development organizations, a further revision of SC 38's scope was approved by JTC 1 in 2017.

Title: Cloud Computing and Distributed Platforms (CCDP)

Scope: Standardization in the areas of Cloud Computing and Distributed Platforms including:

- *Foundational concepts and technologies,*
- *Operational issues, and*
- *Interactions among Cloud Computing systems and with other distributed systems*

SC 38 serves as the focus, proponent, and systems integration entity on Cloud Computing, Distributed Platforms, and the application of these technologies. SC 38 provides guidance to JTC 1, IEC, ISO and other entities developing standards in these areas.

2.2 Accomplishments

SC 38 has consolidated its foundational Cloud Computing standards for vocabulary, concepts and reference architecture in the ISO/IEC 22123 multi-part series. This is an evolution of SC 38's foundational Cloud Computing standards (ISO/IEC 17788 and ISO/IEC 17789) developed in collaboration with ITU/T SG 13. This meets the needs of the ever-evolving Cloud Computing landscape and provides a pathway to keep these foundation standards current. SC 38 approved Standing Document 5 that documents how 22123 series will be maintained and evolved within SC 38.

Since the 2021 SC 38 Business Plan was compiled, these SC 38 projects (3) were completed and published:

ISO/IEC TR 3445	Information technology – Cloud computing – Audit of cloud services (WG 3)
ISO/IEC 19944-2	Cloud computing and distributed platforms – Cloud service and devices: data flow, data categories and data use – Part 2: Guidance on application and extensibility (WG 5)
ISO/IEC 23751	Information technology — Cloud computing and distributed platforms — Data sharing agreement (DSA) framework (WG 5)

SC 38 also progressed the following projects to ballot (4):

ISO/IEC DIS 22123-1	Information technology -- Cloud computing -- Concepts and Terminology – Part 1: Terminology (Revision) (WG 3)
ISO/IEC DIS 22123-2	Information technology -- Cloud computing -- Concepts and Terminology – Part 2: Concepts (WG 3)
ISO/IEC DIS 5140	Information technology — Cloud computing — Concepts for multi-cloud and other interoperation of multiple cloud services (WG 3)
ISO/IEC 19086-2:2018/DAmd 1	Information technology — Cloud computing — Service level agreement (SLA) framework — Part 2: Metric model — Amendment 1 (WG 3)

And initiated work on the following projects (5):

ISO/IEC DIS 22123-3	Information technology — Cloud computing — Part 3: Reference architecture
ISO/IEC PWI 11034	Information technology – Cloud computing – Trustworthiness of cloud services
ISO/IEC AWI TS 7339	Cloud computing and distributed platforms — Cloud computing — Platform capabilities type and Platform as a Service (PaaS)
ISO/IEC PWI 10822	Cloud computing and distributed platforms – Multi-cloud interoperability and portability – Requirements
ISO/IEC PWI 10866	Information technology – Cloud computing and distributed platforms – Digital sovereignty

2.3 Resources

SC 38 meets in Plenary, usually along with its Working Groups, twice each year.

SC 38 Working Groups and Advisory Groups convene electronic meetings throughout the year to advance work between face-to-face meetings. SC 38 Plenary and Working Group meetings continue to be well attended. There is good participation in SC 38's Programme of Work by National Bodies and Liaison Organizations. SC 38 currently has 28 "P" members and 22 "O" Members. See list of SC 38 National Bodies here.

2.4 Competition and Cooperation

Cloud Computing is a hot area in IT that continues to benefit from strong innovations in the marketplace. Many standards setting organization as well as open source initiatives are working in this area. SC 38 is not seeking to replicate work being done elsewhere. Rather, SC 38 prefers to serve in a systems integrator role, referencing best of breed standards and cooperating with forums having specialized expertise to augment the core Cloud Computing and Distributed Platform standardization projects carried out within SC 38. Toward this objective, SC 38 worked with JTC 1/SC 27 (IT Security Techniques) to develop Part 4 of the Service Level Agreement standard (19086-4) and with JTC 1/SC 41 (Internet of Things and related technologies) to develop the Edge Computing standard (TR 23188). SC 38 also had more interactions with JTC 1/SC 7, JTC 1/SC 32/WG 6, JTC 1/SC 40, JTC 1/SC 41 and JTC 1/SC 42 during development of its project on Data Sharing Agreement (ISO/IEC 23751). Furthermore, SC 38 has 11 Liaison Organizations within ISO/IEC, 9 Category A Liaisons and 4 Category C Liaison, with many taking active roles in the work of SC 38; see list here.

3 Work Program

SC 38 develops standards in the area of Cloud Computing and Distributed Platforms (*SC Program of Work*)

3.1 Structure of SC 38

SC 38 carries out its Programme of Work utilizing the following Working Groups:

WG 3 Cloud Computing Fundamentals (CCF)
WG 5 Data in Cloud Computing and Related Technologies

In addition to the two Working Groups, SC 38 re-established AG 1 as the Advisory Group for Stakeholder Engagement. AG 1 will work with JTC 1/AG 1, JTC 1/AG 10 and JTC 1/AG 15 and SC 38/AG 5 to engage with SC 38 stakeholders. This includes, but is not limited to, customers, users, brokers, providers, advocacy groups, consultants, auditors, governments, regulators, standards development organizations (including ISO and IEC) and Open Source communities. AG 1 will be a conduit for two-way information exchange between the stakeholders and SC 38 and include organizing workshops to promote and educate on SC 38's standards and program of work, solicit input, identify gaps, encourage and grow engagement in SC 38, and create informational and educational material to advertise SC 38's work.

AG 1 will work in parallel with AG 5, the advisory group on Long Term Strategy. In addition to providing a long-term strategy and roadmap, AG 5 will provide a forum for discussion of new project ideas in SC 38 for review and prioritization prior to submitting to SC 38 for ballot.

[Historical note: WG 1 – Web Services, WG 2 – SOA and WG 4 – Interoperability & Portability completed their activities and were not re-instated.]

3.2 WG 3 on Cloud Computing Fundamentals (CCF)

Terms of Reference

1. Projects related to Cloud Computing Service Agreements
2. Projects related to fundamental concepts, terminology and definitions for Cloud Computing
3. Projects related to guidance on use of international standards in the development of policies that govern or regulate cloud service providers and cloud services, and policies that govern the use of cloud services in enterprise organizations
4. Establish liaisons and collaborate with other entities within JTC 1, SDOs and consortia performing work related to Cloud Computing

3.2.1 WG 3 Accomplishments

WG 3 published the following International Standards and Technical Reports (1):

ISO/IEC TR 3445	Information technology – Cloud computing – Audit of cloud services

WG 3 progressed the following projects (4):

ISO/IEC DIS 22123-1	Information technology -- Cloud computing -- Concepts and Terminology – Part 1: Terminology
ISO/IEC DIS 22123-2.	Information technology -- Cloud computing -- Concepts and Terminology – Part 2: Concepts
ISO/IEC DIS 5140	Information technology — Cloud computing — Concepts for multi-cloud and other interoperation of multiple cloud services
ISO/IEC 19086-2:2018/DAmd 1	Information technology — Cloud computing — Service level agreement (SLA) framework — Part 2: Metric model — Amendment 1

WG 3 initiated the following project (3):

ISO/IEC DIS 22123-3	Information technology — Cloud computing — Part 3: Reference architecture
ISO/IEC PWI 11034	Information technology – Cloud computing – Trustworthiness of cloud services
ISO/IEC AWI TS 7339	Cloud computing and distributed platforms — Cloud computing — Platform capabilities type and Platform as a Service (PaaS)

3.2.2 WG 3 Deliverables (this year and future)

- 2022 Deliverables
  - Progress ISO/IEC 22123-1 to FDIS
  - Progress ISO/IEC 22123-2 to FDIS
  - Publication of ISO/IEC 19086-2AMD

- Future Deliverables
  - Publication of ISO/IEC 22123-1
  - Publication of ISO/IEC 22123-2
  - FDIS of ISO/IEC 22123-3
  - Progress ISO/IEC 5140 to FDIS
  - DTS of ISO/IEC 7339
  - Publication of ISO/IEC TS 5928
  - PWI 11034 final report & recommendations

3.2.3 WG 3 Risks, Opportunities and Issues

With the change of its Terms of Reference in April 2017 to include Cloud Computing fundamentals such as the fundamental concepts/terminology/definitions for Cloud Computing and the guidance for usage of International Standards in the development of policies, WG 3 has more opportunities to address market needs on a timely basis.

WG 3 needs to continue to focus on future projects that address market requirements, including the evolution of previous products as well as the initiation of new areas of work.

3.3 WG 5 on Data in cloud computing and related technologies

Terms of Reference

1) Standardization in the area of data in Cloud Computing, distributed platforms and related technologies, including but not limited to:

a) Edge computing, federated or multi-cloud data platforms.

b) Transparency in the control, use and sharing of data.

c) Interoperability and portability in these environments.

d) Mechanisms to address data and platform sovereignty concerns

2) Establish liaisons and collaborate with other entities within and external to JTC 1 as appropriate

3.3.1 WG 5 Accomplishments

WG 5 published the following International Standards and Technical Reports (2):

ISO/IEC DIS 19944-2	Cloud computing and distributed platforms – Cloud service and devices: data flow, data categories and data use – Part 2: Guidance on application and

	extensibility [2022-04]
ISO/IEC DIS 23751	Information technology — Cloud computing and distributed platforms — Data sharing agreement (DSA) framework [2022-02]

3.3.2 WG 5 Deliverables (this year and future)

- **2022 Deliverables**
  - ISO/IEC PWI 10866 final report & recommendations

- **Future Deliverables**
  - ISO/IEC PWI 10822 final report & recommendations

WG 5 has an opportunity to continue addressing market needs on a timely basis. WG 5 will continue its work on all cloud data related issues leveraging the expertise of its members in future projects. WG 5 will also focus on interoperability requirements that arise out of the use of multiple cloud services.

The work of WG 5 will support any broader efforts that occur around data within JTC 1, keeping an eye on the distributed computing aspects.

WG 5 needs to continue to focus on future projects that address market requirements, including the evolution of previous products as well as the initiation of new areas of work.