PSCC Subcommittee Study Group Meeting Minutes

Designation: P21	Name: System Architectures Supporting the Virtualization of Substation Protection and Control Applications				
Meeting Location: Teleconference	Meeting Time: 10 AM	Meeting Date: 2022/03/28	Minutes Revised:	Minutes Approved: 2022/04/04	
PAR Output: N/A	PAR Output: N/A	PAR Approval Date: N/A	PAR Expiration Date: N/A	Target Sponsor Ballot Date: N/A	Target Completion Date: N/A
Presiding Officer: Craig Preuss, Chair			Recorded by: Craig Preuss		Draft Number: N/A

Attendance:

Name	Affiliation	Attending via Phone (P) / Web (W) or Local (L)	M/CM/G
Craig Preuss	Black & Veatch	W	M
Scott Mix	PNNL	W	M
Gayle Nelms	SEL	W	M
Jay Herman	EPRI	W	M
Jay Anderson	Retired	W	M
Thomas Rudolph	Schneider Electric GmbH	W	M
Mike Dood	SEL	W	M
Steve Klecker	MidAmerican	W	M
Madhab Paudel	Eaton	W	M
Anthony Sivesind	SRP	W	M
Andre Melo	Schneider Electric	W	M
Veselin Skendzic	SEL	W	M
Shane Haveron	AMETEK	W	M
Prithpal Khajuria	Intel	W	M
Herb Falk	OTB Consulting	W	M
Paul Myrda	EPRI	W	M
Ted (Charles) Witham	Eaton	W	M
Farzad Khalilpour	SCE	W	M
Cole Weber	Advantech	W	M
Dean Samara-Rubio	Intel	W	M
Greg Zweigle	SEL	W	M
Nirmal Nair	University of Auckland, New Zealand	W	M
Ibrahim Abdulhadi	University of Strathclyde, Glasgow		M
Austin Wade	SEL		M
Alan Renouf	VMware		M
Joemoan Xavier	ABB		M
Prasad Shrawane	Greater Sudbury Hydro Inc.		M
Adam Caballero	Eaton		M
Jose Ruiz	Doble		M
Nathan Wallace	Cybirical		M
Jani Valtari	ABB		M
Laurel Brandt	TVA		M

Jean Raymond	Hydro Québec		M
Michelle Afenya	S&C Electric		M
Mickey Schultz	Black & Veatch		M
Darrin Kite	SEL		M
Kannan Devarajan	TTTech		M
Priyanka Nadkar	SEL		M
Jeff Pack	POWER Engineers		M
James Bougie	GPT		M
Alex Apostolov	OMICRON		M
Anthony Johnson	SCE		M
Benton Vandiver	Hitachi Powergrids		M
Byungtae Jang, KR			M
Chris Huntley	SEL		M
Dean Ouellette	RTDS Industries		M
Dennis Holstein	OPUS Consulting Group		M
Dustin Tessier	Tesco Automation		M
Jim Michaelis	Commonwealth Associates. Inc.		M
Jun Verzosa	Doble		M
James Formea	Eaton		M
Song Zhang	ISO New England		M
Miguel Rios	Southern Company		M
Michael Thompson	SEL		M
Fred Agyekum	SEL		M
Sai Chandra Reddy Thota	Megger Ltd		M
Noor Mohd Fadzli B Hj. Othman	PETROLIAM NASIONAL BERHAD (PETRONAS)		M
Eugenio Carvalheira	OMICRON		M
Hao CHEN (来宾)	State Grid Corporation of China		M
Chris Heron	Integrated Power Services		M
Joseph Yang	Advantech		M
Jeff Brown	Advantech		M
Antonello Monti	RWTH Aachen University		M
Arun Shrestha	IEEE		M
Chand Tailor	Eaton		M
Charles Adewole	ERL Phase Technologies		M
Daniel Ridenour	Dominion Energy		M
Daqing Hou	SEL		M
David Dolezilek	SEL		M
Deepak Maragal	NYPA		M
Deryk Yuill	is5		M
Eric Thibodeau	Hydro Québec		M
Florian Ainhirn	Versuchsanstalt für Hochspannungstechnik Graz GmbH | High Voltage Test Laboratory Graz Ltd.		M
Gurudatha (Guru) Pai	GE Digital		M
Jeremy Slimmer	Cybirical		M
Jesse Silva	SCE		M
Joshua Hughes	Patterson Power Engineers		M
Juan Placid	J J Power & Energy Inc.		M
Luke Hebert	Cybirical		M
Mital Kanabar	GE Renewable Energy		M

Murty Yalla	Hubbell		M
Ramakrishna Gokaraju	University of Saskatchewan		M
Richard Kephart	Emerson		M
Steven Blair	Synaptec		M
Thai Li	Hubbell		M
Wayne Stec	Distregen		M
Xavier Manel-la	Siemens		M
Zeus Xioco	SCE		M
M:Member CM: Corresponding Member G: Guest			

Item no.	Notes	Action by
CALL TO ORDER	Meeting was called to order by the chair at approximately 10:03 AM Eastern.	
INTRODUCTIONS AND QUORUM	Introductions were not undertaken, the participants list was used. Quorum does not apply to study group per IEEE-SA rules all attendees are considered voting members.	
CALL FOR PATENTS	Pre-PAR patent slides were shown.	
IEEE-SA COPYRIGHT	IEEE-SA copyright slides shown.	
CHAIR'S REMARKS	General welcome given.	
AGENDA APPROVAL	Scott Mix motion to approve agenda, Thomas Randolph second. No objections or abstentions.	
APPROVAL OF PREVIOUS MINUTES	Scott Mix motion to approve March 14, 2022 meeting minutes, Mike Dood second. No objections or abstentions.	
Action Items	- Follow up with chair of PSCCC P11 TF Cloud Computing, uses and Requirements of Electric Power Utilities (TW Cease) - Copy of CIGRE B5.60 report for P21 will be available by the end of March - CIGRE D2.42 report on time synchronization and distribution, that is a challenge for virtualization. Dennis Holstein will investigate whether that work is addressing virtualization or not, it may have been a survey. - Erin has not provided information on how comments are submitted after publication – via email and US mail?	B5.60 report still in progress and may be able to finalize next week, will be distributed by the chair at that time.
New Business	Definition of substation virtualization: A consistent, secure, and managed approach to the decoupling of software from its dedicated hardware using a variety of hardware architectures to support multiple real-time or near real-time substation applications such as protection, automation, monitoring (e.g., condition-based monitoring, validation, transformation), metering, control (closed- or open-loop), or simulation (e.g., digital twin).	
New Business	What does P21 want to recommend to P0 subcommittee 1. PAR related work, working group (could address trial use) 2. Report related work, task force 3. No future work is needed	
Review of Visio Diagram	The chair shared a Visio diagram showing the system architecture using different approaches. There was discussion around using common industry terms for some of the architecture layers as the draft diagram was trying to differentiate between "application" and "operating system". ISO 22123-1 was mentioned, the chair did not have this immediately available, but did display ISO/IEC TS 23167 that references ISO 22123-1.	
	Missing networking in the diagram, how to show inside the virtual environment?	

Item no.	Notes	Action by
	What standards apply to the different layers of the architecture? IEEE 1613, C37.90 series, and IEC 61850-3 were discussed for the hardware layer.	
	IEEE 1003.1 POSIX was discussed and added to the architecture as it is the standard interface between applications and operating systems that would guarantee functionality across platforms but not the performance.	
	IEC TC 95 Working Group 2 is looking into what happens when protection relay application is separated from the I/O acquisition. Will be IEC TR 60255-216-1, presently at CD2. This is applicable not only to process bus, but also to virtualization. That group has identified the need for standards addressing the PIU similar to what already exists for merging units.	
	The Visio diagram was updated during the meeting to establish a common understanding of the architecture layers and determine where there could be existing or ongoing standards development work underway. Refer to the embedded file below.	Chair to provide Visio native file and pdf file in iMeet.
ITEMS REPORTED OUT OF EXECUTIVE SESSION	There was no executive session.	
TIME OF FINAL ADJOURNMENT	The meeting was adjourned at approximately 11:30 AM Eastern.	
NEXT FACE TO FACE MEETINGS	April 4, April 11, April 18, April 25 and May 2 May 9-12, 2022 • Reno, NV • Meeting draft has P21 scheduled on Monday, May 9 from 5-6 pm Pacific Time	
FUTURE MEETING ROOM REQUIREMENTS	N/A for room size, projector, conflicts.	

Virtualization
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Virtualization
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