



CINI4.0 Conference Day

16/06/2022

Converging Industrial Networks for Industry 4.0
New challenges for wired ethernet

Philippe Saey
Jos Knockaert



Supported by:



on the basis of a decision
by the German Bundestag

CORNET

- Applied research – limits & feasibility studies
- Technology transfer

CINI4.0

- Funding Organizations:
 - AiF (German Federation of Industrial Research Associations)
 - Vlaio (Vlaams Agentschap Innoveren & Ondernemen)

- CORNET project

- **Project Partners:**

- KU Leuven, Technogecampus Gent (C, “coordinating association”)
 - UGent, campus Kortrijk (R, “research performing organization”)
 - TH-OWL / inIT (Lemgo) (R)
 - Fraunhofer IOSB-INA (Lemgo) (R)
 - FE ZVEI (A, “Association”)

- CORNET project
 - **User group**

- Phoenix Contact NV/SA (Zaventem)
- Prokorment VOF (Delft, The Netherlands)
- Bintz NV/SA (Zaventem)
- Prolink Engineering BV (Deinze)
- ArcelorMittal Belgium NV/SA (Zelzate/Gent)
- DSP Valley vzw (Leuven)
- Linkworx BVBA (Aalter)
- Volvo Cars Gent (Oostakker/Gent)
- iBA Benelux BVBA (Gent)
- VMA NV/SA (Sint-Martens-Latem)
- Agoria vzw (Brussel)
- Siemens NV/SA (Huizingen)
- Endress+Hauser SE+Co. KG (Maulburg)
- Hilscher Gesellschaft für Systemautomation GmbH (Hattersheim am Main)
- Indu-Sol GmbH (Schmölin)
- Perinet GmbH (Berlin)
- rt-solutions.de GmbH (Köln)
- ZVEI e.V. (Frankfurt am Main)
- R. STAHL Schaltgeräte GmbH (Waldenburg)
- TOSIBOX GmbH (Lemgo)
- ESR Pollmeier GmbH Servo-Antriebstechnik (Ober-Ramstadt)
- InnoRoute GmbH (München)
- Lenze SE (Aerzen)

- Background: Merging IT and OT

- Technologies:

- SPE & APL
- TSN
- OPC UA

- Questions:

- Feasibility
- Limits
- Design tools for network planning
- Robustness (redundancy, EMI)
- Training

- Methods:

- Survey of solutions
- Develop test cases
- Demonstrate & measure at component level and at system level (lab and industry)
- Develop workshops and courses

Workpackages

WP1 – Literature study

WP2 – Measuring concepts & experimental quantification on component level

- Design of measuring methods / Experimental quantification of operational properties / Verification of robustness at component level

WP3 – From data to information: OPC UA as middleware

- Operational aspects of OPC UA and information modelling / Assessment of the built-in security aspects of PN/TSN/OPC UA

WP4 – Experimental quantification at system level

- Integration of components into systems / Measuring operational properties / Designing for robustness at system level

WP5 – Validation using large lab setups or industrial use cases

- Validation of design methods on industrial grade use cases / Migration and implementation aspects in brownfield installations

WP6 – Knowledge transfer

- Website design / Promotional activities / Technology radar / Hands-on training and workshops + Conferences/fairs/seminars/ Closing event

cini40.eu

Next actions

Workshops



CINI Conference 2023

Next project?



Enabling robust, converged networks for Industry 4.0

Organized and Co-Chaired by

Lukasz Wisniewski¹, Jos Knockaert², Philippe Saey³

¹ Institute Industrial IT – inIT / TH-OWL, Lemgo, Germany

² EELAB/Lemcko - Ghent University, Kortrijk, Belgium

³ ESAT-ELECTA - KU Leuven, Gent, Belgium

This conference day ...

- Is a mixture of lectures and interactive discussions
- On both current practices and new emerging topics in “industrial communication”
- We have provided long breaks for interaction with the speakers, companies and other attendants, and of course to look at the demonstrations
- We moved away from campus this time ...
- 35 minutes/lecture in the schedule:
 - We start on the hour mentioned in the left column
 - In minutes: lecture = 25, Q&A = 5, change speaker = 5
 - You can change between each session during speaker change (5 min)
- Speakers – please keep your timing!
- You are of course invited to the networking reception at the end.

A view on the schedule

The CINI4.0 project - Overview of the day					Philippe Saey - Jos Knockaert	ENG
					Room Track 1	
Single Pair Ethernet					Philippe Saey	ENG
Track 1			Track 2			
"Industrial Data Communication - New Developments"			"Industrial Data Communication - Current practices"			
Session chair:			Session chair:			
Time-Sensitive Networking (TSN) - PROFINET over TSN	Peter-Jan Deltour, Phoenix Contact	NL	IO-Link: werkingsprincipe, specificaties en toepassingsmogelijkheden	Arne Grimonprez, Pepperl + Fuchs - A. Wayenberg, Agoria	NL	
TSN performance assessment in brownfield PROFINET implementations	Arne Verhoeven, KU Leuven - CINI4.0	E	PLCnext: an open source IIoT ready PLC	Hugo Van Rillaer, Phoenix Contact	NL	
Wireless IO-Link: Technology and specifications - Application ideas	Jason Minto & Robin Hirto, CoreTigo Germany	E	Industrial network security by network segmentation	Bart Boumans, Siemens	E	
Lunch and market place						
Packet analysis in converged IT and OT networks	Remco de Rooij, Allegro Packets	E	Why we need OT-OT and OT-IT network convergence and how do we reach it? (Part 1)	René Heidl, Indu-Sol Germany	E	
Manage and Monitor industrial networks efficiently	Johan Van den Eede, Siemens	E	Why we need OT-OT and OT-IT network convergence and how do we reach it? (Part 2)	René Heidl, Indu-Sol Germany	E	
APL - Advanced Physical Layer: SPE for the process industry	Benedikt Spielman, Endress+Hauser Switzerland	E, RE	EMC - Introduction and industrial use cases	Jos Knockaert, UGent - CINI4.0	E	
Coffee and market place						
Zero Trust private access for enabling highly secure access to industrial automation environments	Johan Van den Eede, Siemens	E	The Ethernet physical layer revisited	Mathieu Troch, KU Leuven - CINI4.0	E	
Secure Industrial communication over TSN to protect your devices against hackers and cyberthreats	Kurt van Buul, HMS - Bintz	E, OL	Assuring Cabling Infrastructure Readiness - Advanced cable testing for standard and Single Pair Ethernet	Steven J. Cowles, AEM - USA	E, OL	
Networking drink						

A view on the schedule – Track 1

Track 1				
"Industrial Data Communication - New Developments"				
Session chair:				
10h00	10h35	Time-Sensitive Networking (TSN) - PROFINET over TSN	Peter-Jan Deltour, Phoenix Contact	NL
10h35	11h10	TSN performance assessment in brownfield PROFINET implementations	Arne Verhoeven, KU Leuven - CINI4.0	E
11h10	11h45	Wireless IO-Link: Technology and specifications - Application ideas	Jason Minto & Robin Hirto, CoreTigo Germany	E
11h45	13h15	Lunch and m		
13h15	13h50	Packet analysis in converged IT and OT networks	Remco de Rooij, Allegro Packets	E
13h50	14h25	Manage and Monitor industrial networks efficiently	Johan Van den Eede, Siemens	E
14h25	15h00	APL - Advanced Physical Layer: SPE for the process industry	Benedikt Spielman, Endress+Hauser Switzerland	E, RE
15h00	15h45	Coffee and n		
15h45	16h20	Zero Trust private access for enabling highly secure access to industrial automation environments	Johan Van den Eede, Siemens	E
16h25	16h50	Secure Industrial communication over TSN to protect your devices against hackers and cyberthreats	Kurt van Buul, HMS - Bintz	E, OL

A view on the schedule – Track 2

Track 2		
"Industrial Data Communication - Current practices"		
Session chair:		
IO-Link: werkingsprincipe, specificaties en toepassingsmogelijkheden	Arne Grimonprez, Pepperl + Fuchs - A. Wayenberg, Agoria	NL
PLCnext: an open source IIoT ready PLC	Hugo Van Rillaer, Phoenix Contact	NL
Industrial network security by network segmentation	Bart Boumans, Siemens	E

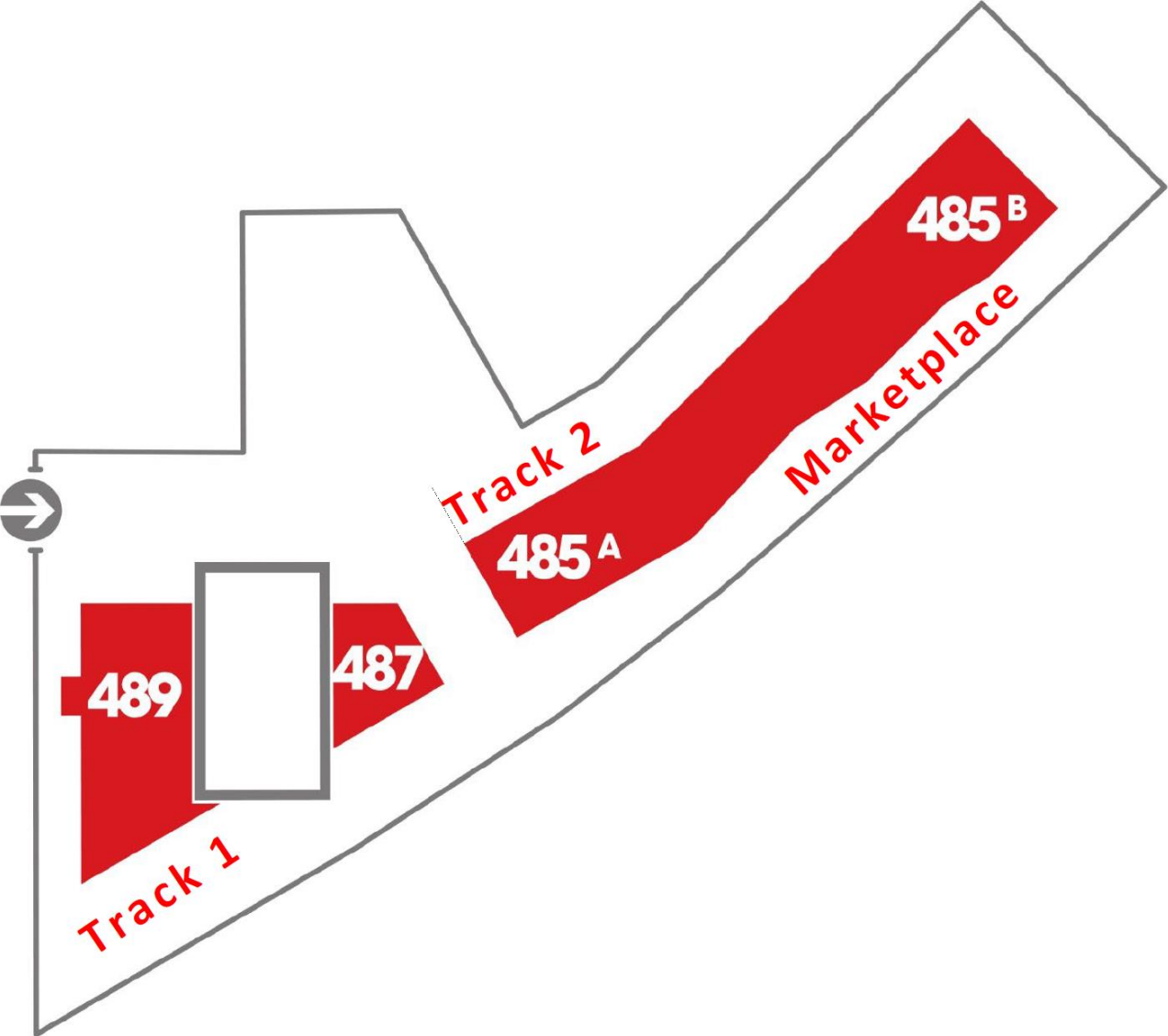
market place

Why we need OT-OT and OT-IT network convergence and how do we reach it? (Part 1)	René Heidl, Indu-Sol Germany	E
Why we need OT-OT and OT-IT network convergence and how do we reach it? (Part 2)	René Heidl, Indu-Sol Germany	E
EMC - Introduction and industrial use cases	Jos Knockaert, UGent - CINI4.0	E

market place

The Ethernet physical layer revisited	Mathieu Troch, KU Leuven - CINI4.0	E
Assuring Cabling Infrastructure Readiness - Advanced cable testing for standard and Single Pair Ethernet	Steven J. Cowles, AEM - USA	E, OL

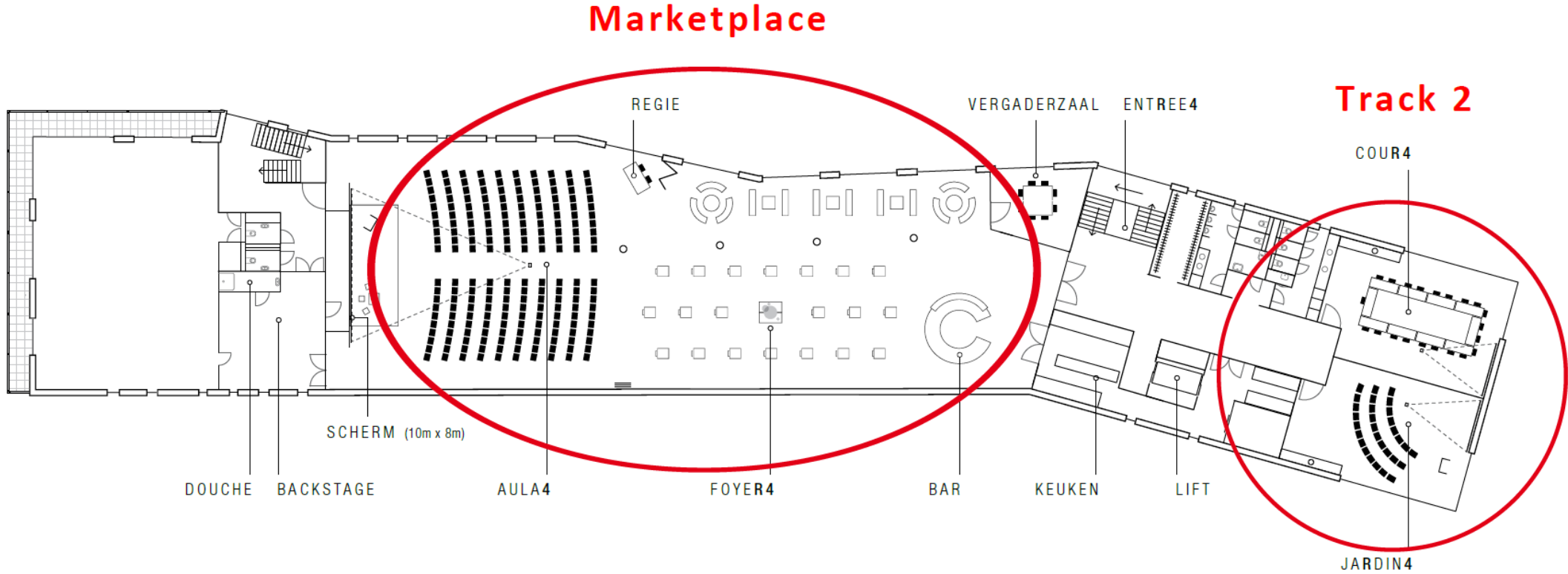
Location RodeBol



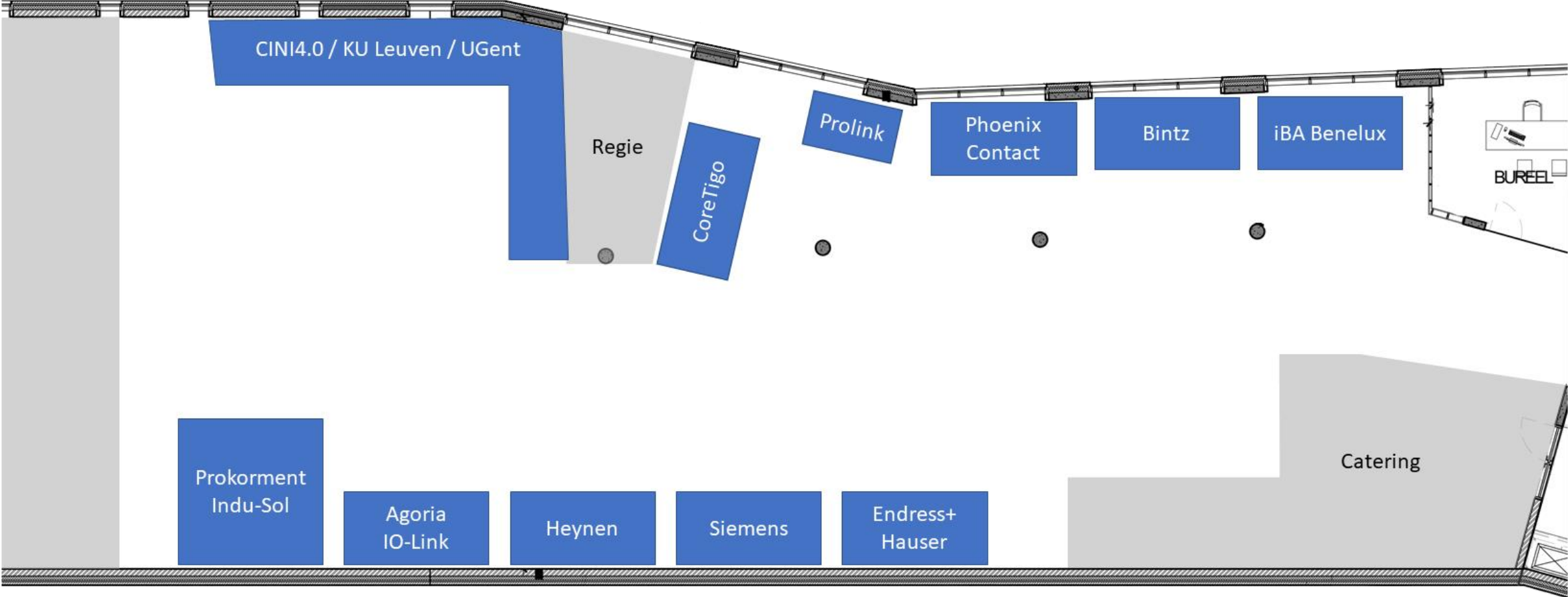
Location RodeBol – Market place & Track 1 room

AUDITORIUM4

Multimediale congres- & eventruimte



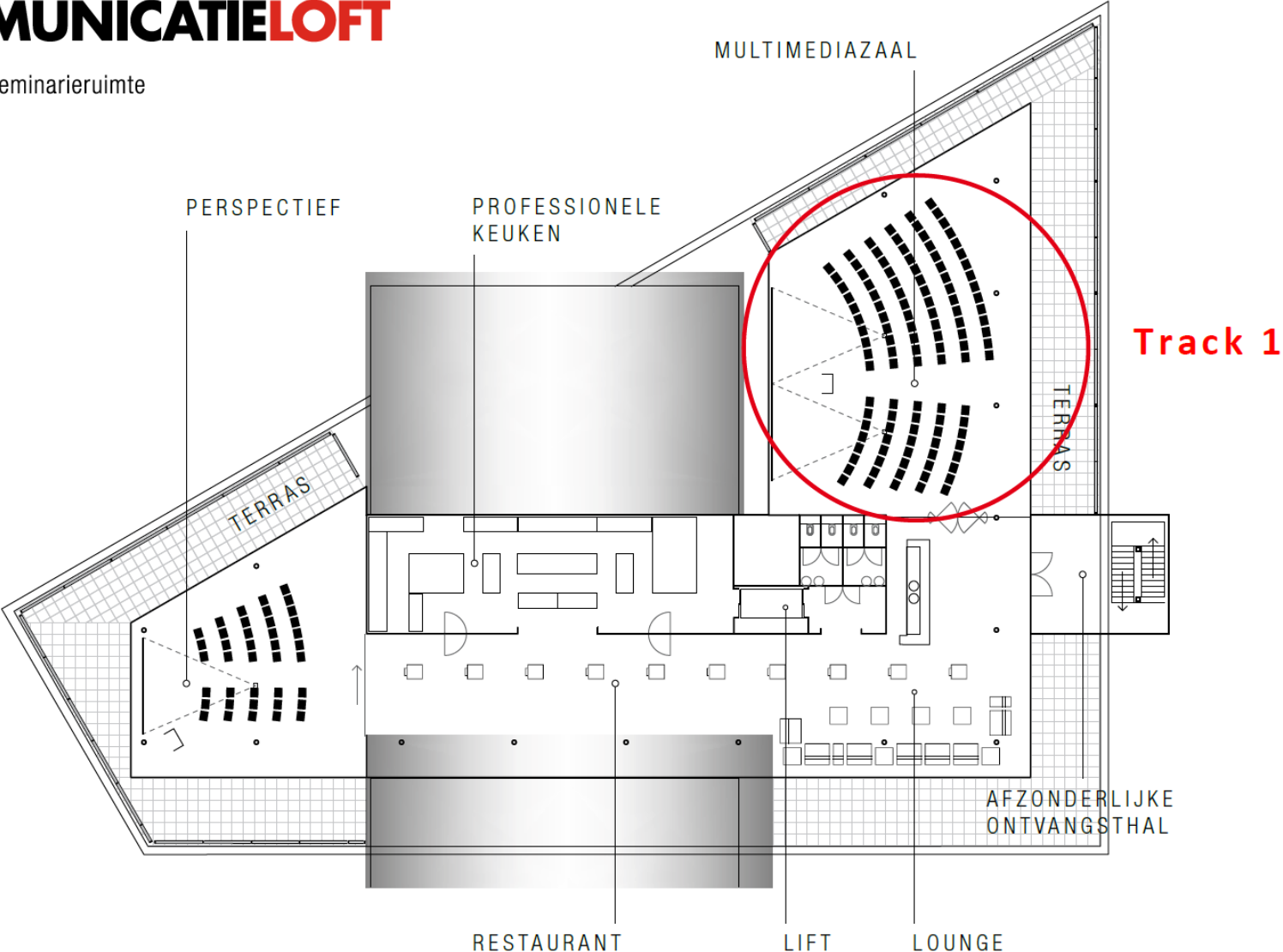
Location RodeBol – Market place



Location RodeBol – Track 1 (and plenary) room

COMMUNICATIELOFT

Multimediale seminarieruimte



Some practical stuff

- Do you have your badge / Did you sign in when arriving?
- Slides in pdf format will be available afterwards
- In your folder:
 - Program of the day – Information on the location
 - A 4 page survey that fills in very quickly!
- Please fill in the survey!
 - Deposit it at the end of the day (including badge) at the entry
 - It provides some feedback but also informs us about which topics interests you
 - It's important for the project KPIs
- Enjoy your day !