Welcome to the 2nd NDS Public Conference!

24.09.2020, Frankfurt / Online

Start at 14:00 (CEST)

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NDS Public Conference

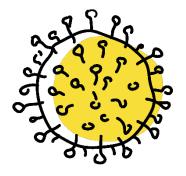| Time		Subject	
14:00 – 14:20	1.	Welcome Notes, Introduction to 2nd NDS Conference	Martin Schleicher, NDS Chairman
14:20 – 14:40	2.	NDS Technical Achievements 2019/2020	Fabian Klebert, NDS
14:40 – 15:20	3.	Introductions of New NDS Members: FCA, Huawei, INAVI, TRI-AD	New NDS Members
15:20 – 16:00	4.	How Volkswagen Profits from NDS: Past, Present and Future	Markus Kerper, Volkswagen
16:00 – 16:45	5.	NDS.Classic Applications • Map Streaming on NDS • Leading the way: How Standardization helped scaling TomTom's NDS business	Mihai Cozma, Telenav Robert Krumpolt, HERE Volker Hiestermann, TomTom
16:45 – 16:55	**Break**		
16:55 – 17:50	6.	NDS.Live Release • Introduction and Overview • NDS.Live Joint Development Team	Fabian Klebert, NDS Boris Gumhold, HERE Dirk Legler, JOYNEXT Emanuel Elhardt, Elektrobit Nico Glorius, NavInfo Otto Nyiro, NNG
17:50 – 18:00	**Break**		
18:00 – 18:20	7.	NDS Future	Georg Horn, NDS
18:20 – 18:30	8.	Closing Remarks	Martin Schleicher, NDS Chairman

Why do we organize „NDS public conferences"?

- Communicate NDS strategy and benefits publicly
- More visibility and awareness for NDS
- Discussion and feedback with the industry

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NDS and Corona

- In early March 2020, we replaced all in-person meetings by online meetings

- In June 2020, we recommended to make online meetings the default until end of 2020

Implications of Corona for NDS:

- The work progress in NDS was not limited by Corona

- Some savings in travel costs by subcontractors could even be used to accelerate work

- Apart from OADF event on July 9, 2020, the NDS marketing activities focused on new website and LinkedIn

NDS is THE worldwide standard for map data in automotive eco-systems

NDS is THE worldwide

worldwide coverage and global adoption

standard for map data

one specification with enough flexibility
for a customized user experience

data model (structure & semantics),
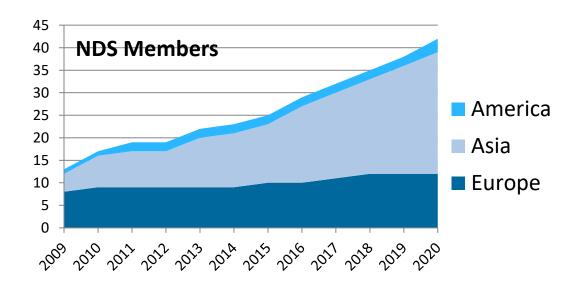storage format, interfaces, protocols

in automotive eco-systems

in-vehicle applications, companion applications, cloud applications, vehicle related services,
supporting navigation, driver assistance and autonomous driving

The NDS Association is Growing

- Number of members was constantly growing up to 42 today
- Majority of members from Asia and Europe
- Up to now 51 evaluation contracts (1 year ago: 32)

NDS Members — Area chart showing membership from 2009 to 2020, categorized by America, Asia, and Europe.

NDS Welcomes its New Members!

- Toyota Research Institute, Japan
- INAVI Systems, South Korea
- Hitachi, Japan
- Fiat Chrysler Automobiles, USA

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Recent Website Articles

EVENT

NDS Public Conference 2020 – join us online
31. August 2020

Learn more about NDS, the worldwide standard for map data in automotive eco-systems at the NDS Public Conference 2020. Free and online on September 24th.

Show article →

NEWS

New NDS Member: Hitachi, Ltd.
24. August 2020

The NDS Association is happy to welcome Hitachi, Ltd. as a new member.

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BLOG ARTICLE

Data for all: Enabling autonomous driving with ADASIS
19. August 2020

NDS partner ADASIS enables driver assistance systems to access navigation data for predictive driving features.

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NEWS

On the road with NDS: New Volkswagen Golf VIII
11. August 2020

The new Volkswagen Golf VIII features navigation based on the NDS map format.

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EVENT

Recap of the 13th Open Auto Drive Forum event – a successful virtual meeting
28. July 2020

Automotive experts from all over the world met for the first completely virtual Open Auto Drive Forum event.

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NEWS

First implementation of NDS.Live started by NDS members' joint development team
20. July 2020

NDS members Elektrobit, HERE, JoyNext, NavInfo and NNG are joining forces to make NDS.Live ready for its release later this summer.

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BLOG ARTICLE

Data for all: Sharing sensor data with SENSORIS
9. July 2020

NDS partner SENSORIS is a global platform for the standardization of in-vehicle sensor data and its efficient exchange.

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NEWS

Open Auto Drive Forum on July 9th – meet autonomous driving data standard stakeholders online
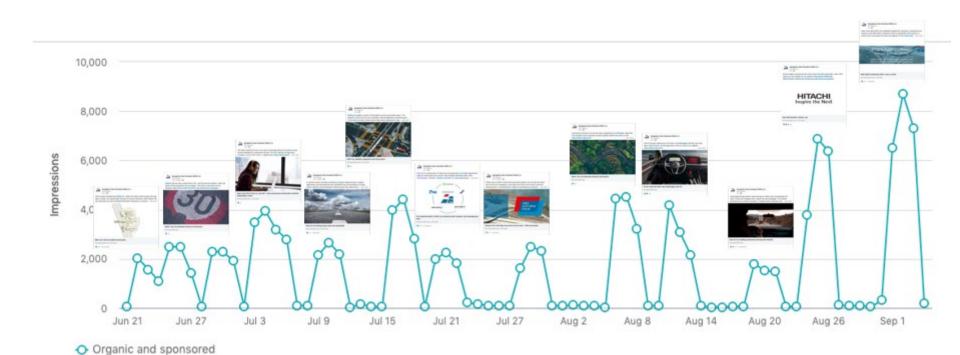2. July 2020

The OADF is a discussion platform driving standardization in the area of autonomous driving. The next event is an online meeting – you are invited!

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NDS LinkedIn Updates and Impressions

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Technical Development: NDS.Classic, NDS.Live and Tooling
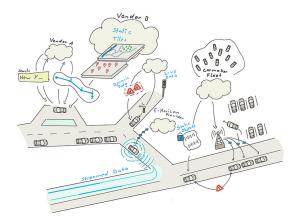
- **NDS.Classic maintained**
  - Extensions for stable location IDs and end-to-end safety
  - Improved test coverage

- **NDS.Live ramped-up**
  - Developed modular concept and map data service interfaces for live, dynamic and static map data
  - Started reference implementations

- **NDS Tooling extended**
  - Serialization extended, e.g., by ASIL-ready C++ code generator
  - OpenDrive Converter support for 2.5.2++ (incl. 2.5.4)
  - Improved Database Inspector & NDS Mapviewer for NDS.Classic
  - New 'Nds.Live Lab' – for inspection of NDS.Live services and display of maps
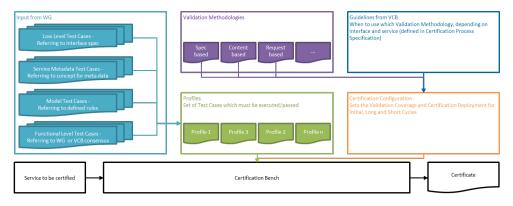
NDS Certification

Certificates accumulated

- Doubled number of NDS Certificates since June 2019

- 7 new versions of Certification Bench, now supporting FTX certification

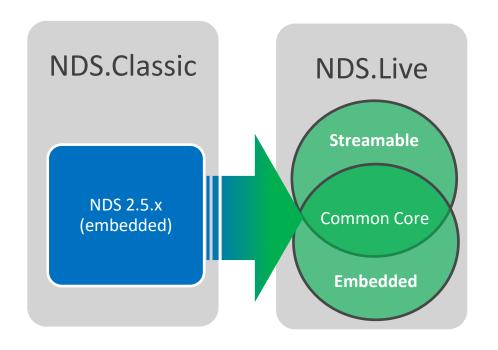First Concept for NDS.Live certification ready

NDS.Classic HD Maps for AD - Availability

Who	Statements on Coverage
AutoNavi	China: All highway and expressways, city normal roads of 4 cities until end of 2021
Baidu	China: All highways and expressways, 349 cities, some urban and industrial park roads with full features
HERE	North America and Western Europe: Ongoing global coverage roll-out
Kuandeng	China: Over 300 cities and highway and urban expressway Germany and Korea: Several hundred kilometers including highway and urban roads
NavInfo	China: 100% highway coverage roll-out of urban coverage
Navis-AMS	South Korea: All highway and city expressways, all 4-lane roads
TomTom	United States, Canada, Western Europe and Japan: ongoing global coverage roll-out
Zenrin	Japan

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NDS Future and Roadmap: NDS.Live -> NDS as a Service

NDS.Classic

NDS 2.5.x
(embedded)

NDS.Live

Streamable

Common Core

Embedded

- Product Lines of NDS.Live:
  streamable + embedded
  to enable hybrid-scenarios and fallback solutions

- Clear separation between NDS.Classic and NDS.Live Generation for embedded
  - **re-factored embedded**
    map data are part of NDS.Live
  - **Much stricter backward compatibility rules for NDS.Live**
  - **New concepts won't be back-ported to 2.5.x branch (NDS.Classic)**
  - NDS.Classic will be maintainted in the future

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NDS.Live License Model ford 3rd parties is under Work

NDS.Classic

§ NDS.Live Member Contribution and
  Dissemination Agreement
  • Transfer of IP in NDS.Classic
    relevant for NDS.Live
  • Transfer of rights on contributions
    of Members during NDS.Live
    development

NDS.Live

§ Evaluation
  License for NDS.Live

NDS e.V.

NDS Community

§ Legal Review according to NDS e.V. Bylaws &
  Member Cross License Agreement

NDS Certification

NDS Member

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NDS meets Export Regulations

Exchange of technologies in the standard development can be subject to export regulations:

- In 2020, we changed the NDS.Live development process for minimizing the risk of all NDS members to get in conflict with US export rights
- Based on new rule by the US BIS and an NDS self-assessment, we hope to return to the initial development process again
- The self-assessment addresses:
  - The qualification of NDS as a 'Standard Organization'
  - The review of the US Commercial Control list with respect to the items we deal with in NDS typically

(1) Self-Assessment "Standards Organization"

The table below was provided by Freshfields for assessing whether NDS qualifies as 'Standards Organization'.

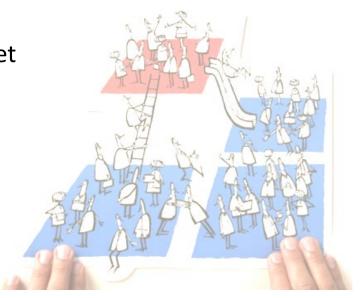The last column shows the assessment. The descriptions make reference to

- to the NDS Articles of Association (AoA),
- to the NDS Bylaws,
- to the NDS Project Handbook.

Standards Organization Criteria	Definition	NDS Analysis (DRAFT)
Openness	The procedures or processes used are open to interested parties. Such parties are provided meaningful opportunities to participate in standards development on a non-discriminatory basis. The procedures or processes for participating in standards development and for developing the standard are transparent.	**Fulfilled.** The NDS Association welcomes all organizations. The AoA and the Bylaws of the NDS Association as well as the license agreement between all members are made available for all interested parties prior to a potential application. There is no restriction in admitting applying members *(AoA, §3 Acquisition of Membership (1))*. The accession process follows a voting procedure in the Steering Committee (SC) which allows denying admissions if there are serious reasons to do so (e.g., fraudulent behavior). If a member candidate is rejected by the SC, it can ask the General Assembly to make a decision on the application. *(AoA, §3 Acquisition of Membership (3))*. As of today (2020), no application for an NDS membership has ever been rejected in the SC. The following applies since the NDS Association was founded (status 2020): • All members are subject to the same membership fee. The membership fee was last confirmed by the Steering Committee in its meeting on November 13, 2019 in the context of the budget plan 2020 *(see meeting minutes, agenda item 7)*. • New members pay an additional admission fee to at least partially compensate for the investments from existing members in the

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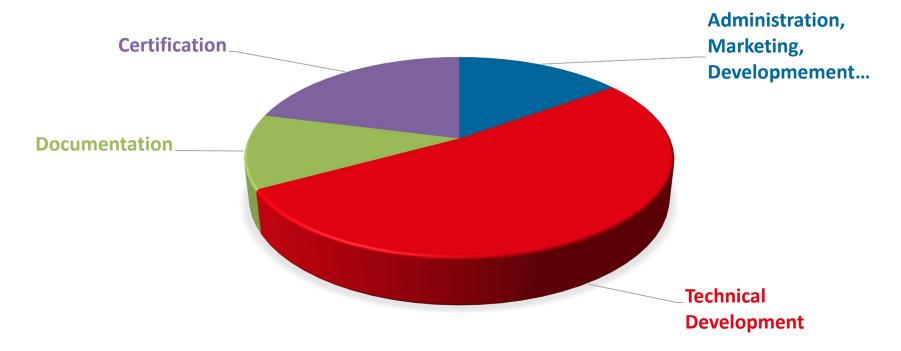
Why to Become NDS Member?

- **Access to NDS specification and documentation,**
  to **NDS Support Team** and to a **lively NDS community**

- **Access to NDS tools** supporting the development of NDS compliant products

- **New business opportunities**, as there is a
  high demand for NDS compliance in the market

- **Avoid duplicate work** from the collaboration
  within NDS at development and testing

- **Cross-license** of other **NDS members' IPs**
  for own NDS products

- **Influence on the future development** of the
  NDS standard to the benefit of own business

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How are Membership Fees used in NDS?

The NDS Membership fees are well invested!

Certification

Documentation

Administration,
Marketing,
Developmement...

Technical
Development

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Rights and Duties of NDS Members

- Rights
  - Access to NDS specification
  - Participation and contribution to development
    of standard in all technical Working Groups
    (present Working Groups:
    'Map Format', 'Autonomous Driving', 'Next Generation Architecture')
  - Use of the other NDS members' IPs for own NDS compliant solutions
  - Qualified for election in Steering Committee and Technical Committee

- Duties
  - Accession to NDS Cross License Agreement
  - Entry fee of 60.000€ / Membership fee of 60.000 € per calendar year

Call to Action

- We are interested your feedback regarding:

  Visibility of NDS and marketing activities

  Product definition and roadmap

  New product structure with NDS.Live and NDS.Classic

  Software layer wrapping database

  Simpler access to NDS for non-commercial use

- We are available: Georg Horn, Fabian Klebert, Markus Junker or myself.