

MORA

Modular Open Radio
Frequency Architecture



Developed by U.S. Army
DEVCOM C5ISR Center



Promotes interoperability
between RF components



Extension to VICTORY
standard



Uses MORA Data Messages
(MDMs) for communication
across system



7 Types of MDMs:

- Types 2–7 are fixed length
and simple
- Type 1 extends VITA 49.2
and is significantly more
complex



PACMAN

Parser Combinator for MORA Networks

1. Secure parser for MORA-compliant systems
2. Parse MDM packets in transport to ensure
MORA specification compliance
3. Reduce the need for error handling
at the destination
4. No edge cases
5. Defines a grammar by which MDMs
must abide
6. Formally ensure that packets are bug-free
7. Use for MDM Types 1–7

Hammer

Open-source Parser-
combinator library



The Hammer library, developed by
Dr. Meredith L. Patterson of Special
Circumstances LLC, is the core of
PACMAN



Allows for the composition
of large parsers via smaller parsers



Language-based approach
to security:

- Stop handling input
edge cases
- Discard non-conforming
input at the parser level



Create grammars as inline
domain-specific languages



Parsers often present themselves as a significant source of vulnerable code.



Security is often overlooked as one of a parser's main goals.



The ubiquity of parsers warrants the need for security.



Insecure parsers, see: Samba Web Administration Tool Base64 exploit (CVE-2004-0600).



LANGSEC requires that a grammar be developed for what should be successfully parsed.



LANGSEC parsers open the opportunity for formal verification.



PACMAN

Parser Combinator for
MORA Networks

Scan to visit our virtual booth
for papers, demonstrations,
and our GitHub repository



riversideresearch.org/SOSA2022



*Tackling the
Science
of Insecurity
through
Formal
Methods*



CONTACT US

SOSA@riversideresearch.org



PACMAN

Parser Combinator for
MORA Networks