

# WebGuide Data Structure

## Introduction

WEBGUIDE is a Collaborative Knowledge-Building Environment (CoKBE) developed at the University of Colorado by Gerry Stahl and colleagues. Its distinctive feature is "perspectives", a mechanism for associating notes with individuals and groups.

This document describes the Design Rationale behind the WEBGUIDE data structure and provides the following representations of the WEBGUIDE data structure:

- [eXtensible Markup Language \(XML\)](#)
- [Backus-Naur Form \(BNF\)](#)
- [Relational Database Schema](#)
- [MySQL table creation commands](#)

## Design Rationale (DR)

The general design of data in a WEBGUIDE Space includes Nodes, Links, Information (about users, groups and database tables), Content (of Nodes), Positions and Transactions.

**Spaces** are distinct databases of information used by different WEBGUIDE applications.

**Nodes** contain attributes that are common to all data elements in WEBGUIDE and are necessary for identification and display. Basically, everything in a WEBGUIDE Space is represented as a Node, except for relations among Nodes, which are represented as Links. There are many different kinds of Nodes, distinguished by their Node\_Kind attribute. Each Node can have a textual name and description. It is tagged with information about when it was created, by whom and in which Perspective. If there is additional information associated with the Node, then there is a reference to a record within a supplementary Content table. Note that "Nid" refers to the unique identifier of a Node. Much system information is encoded in Nodes rather than being hard-coded in global constants. Thus, the Nodes table serves multiple purposes, including storing the defined Node\_Kinds, Link\_Types, and definitions of Perspectives, People, Groups and Tables used within the definition of a Node itself. This approach allows for dynamic changes to these lists (e.g., new Link\_Types) by end-users. It also makes all data relative to Perspectives and tagged by author for uniform filtering and searching. For an example, see the [test data](#) in the XML document below.

**Links** define relationships between pairs of Nodes. This information is stored separately from the Node information so that Links can be used bi-directionally without duplication of information and so that they can be searched efficiently. There are several different types of Links, distinguished by their Link\_Type attribute.

**Information** is supplementary Node information for People, Groups, Tables.

**Tables** contains a coded representation of the structure of additional database tables, including tables with supplementary node information and other user-defined tables.

**Content** is supplementary Node content for Statements, Decisions, Books, Multimedia, Objects, Email.

**Positions** define the (X, Y) coordinates of a Node in a Perspective for a graphical display.

**Transactions** track events, such as changing Perspective, creation of a new Node or Link, logging in a new Person. This table logs events for research about system usage; it maintains usage data. It can be used to compute which notes were displayed for which users.

### eXtensible Markup Language – Document Type Definition (XML DTD)

```
<?xml version="1.0"?>
<!-- WEBGUIDE version 1.2 XML data structure -->
<!-- created 5/25/99 by GerryStahl -->
<!-- revised 6/04/99 by GerryStahl -->
<!-- contact: Gerry.Stahl@Colorado.edu -->

<!-- to run in DOS, cd d:\program files\xml -->
<!-- msxml wg.xml -d1 -o wg.out -p -->

<!-- following is the Document Type Definition: -->

<!DOCTYPE SPACE [

<!-- SPACE is a database containing a webguide knowledge SPACE -->
<!ELEMENT      SPACE      EMPTY >
<!ATTLIST      SPACE
      SID          ID          #REQUIRED
      NAME         CDATA      #REQUIRED
      DRIVER       CDATA      #REQUIRED
      URL          CDATA      #REQUIRED
      USERNAME     CDATA      #REQUIRED
      PASSWORD     CDATA      #REQUIRED
      DBMS         CDATA      #REQUIRED
      COMMENT      CDATA      #IMPLIED >

<!-- NODE is an element of information in a SPACE -->
<!ELEMENT      NODE      EMPTY >
<!ATTLIST      NODE
      NID          ID          #REQUIRED
      KIND         IDREF      #REQUIRED
      PERSPECTIVE  IDREF      #REQUIRED
      SUPTABLE     IDREF      #IMPLIED
      CONTENT      IDREF      #IMPLIED
```

NAME	CDATA	#REQUIRED
DESCRIPTION	CDATA	#IMPLIED
AUTHOR	IDREF	#REQUIRED
CREATED	CDATA	#REQUIRED
EDITOR	IDREF	#IMPLIED
MODIFIED	CDATA	#IMPLIED >

<!-- **LINK** is a relation between two NODEs in a SPACE -->  
 <!-- this definition conforms to the XLINK recommendation-->

```
<!ELEMENT      LINK      EMPTY >
<!ATTLIST     LINK
  XML:LINK     CDATA      #FIXED      "extended"
  INLINE       (true | false) "false"
  ROLE         CDATA      #IMPLIED
  TITLE        CDATA      #IMPLIED
  SHOW         (replace | new | embed) #IMPLIED
  ACTUATE      (auto | user) #IMPLIED
  BEHAVIOR     CDATA      #IMPLIED
  CONTENT-ROLE CDATA      #IMPLIED
  CONTENT-TITLE CDATA      #IMPLIED
  LID          ID         #REQUIRED
  TYPE         IDREF      #REQUIRED
  PERSPECTIVE IDREF      #REQUIRED
  SEQ          CDATA      #IMPLIED
  AUTHOR       IDREF      #REQUIRED
  CREATED      CDATA      #REQUIRED >
```

<!-- **FLOCATOR** is the location of a NODE From which a LINK is defined -->  
 <!-- this definition conforms to the XLINK recommendation-->

```
<!ELEMENT      FLOCATOR  EMPTY >
<!ATTLIST     FLOCATOR
  XML:LINK     CDATA      #FIXED      "locator"
  HREF         IDREF      #REQUIRED
  ROLE         (from | to) "from" >
```

<!-- **TLOCATOR** is the location of a NODE To which a LINK is defined -->  
 <!-- this definition conforms to the XLINK recommendation-->

```
<!ELEMENT      TLOCATOR  EMPTY >
<!ATTLIST     TLOCATOR
  XML:LINK     CDATA      #FIXED      "locator"
  HREF         IDREF      #REQUIRED
  ROLE         (from | to) "to" >
```

<!-- **INFORMATION** includes People, Groups and Tables -->

<!-- **PERSON** is a user -->

```

<!ELEMENT      PERSON      EMPTY >
<!ATTLIST     PERSON
  ID           ID           #REQUIRED
  NID          IDREF        #REQUIRED
  USERNAME     CDATA        #REQUIRED
  PASSWORD     CDATA        #REQUIRED
  PERSPECTIVE IDREF        #REQUIRED
  FULLNAME     CDATA        #IMPLIED
  FIRST        CDATA        #IMPLIED
  MIDDLE       CDATA        #IMPLIED
  LAST         CDATA        #IMPLIED
  EMAIL        CDATA        #IMPLIED
  HOMEPAGE     CDATA        #IMPLIED
  GENDER       CDATA        #IMPLIED
  COLOR        CDATA        #IMPLIED
  WORK_PLACE   CDATA        #IMPLIED
  WORK_TITLE   CDATA        #IMPLIED
  HOME_PHONE   CDATA        #IMPLIED
  WORK_PHONE   CDATA        #IMPLIED >

```

<!-- **GROUP** is a team of users -->

```

<!ELEMENT      GROUP      EMPTY >
<!ATTLIST     GROUP
  ID           ID           #REQUIRED
  NID          IDREF        #REQUIRED
  PASSWORD     CDATA        #IMPLIED
  REPRESENTATIVE IDREF      #IMPLIED
  EMAIL        CDATA        #IMPLIED
  HOME_PERSPECTIVE IDREF    #IMPLIED >

```

<!-- **TABLE** is an auxilliary database table -->

```

<!ELEMENT      TABLE     EMPTY >
<!ATTLIST     TABLE
  ID           ID           #REQUIRED
  NID          IDREF        #REQUIRED
  FIELD0       CDATA        #REQUIRED
  FIELD1       CDATA        #IMPLIED
  FIELD2       CDATA        #IMPLIED
  FIELD3       CDATA        #IMPLIED
  FIELD4       CDATA        #IMPLIED
  FIELD5       CDATA        #IMPLIED
  FIELD6       CDATA        #IMPLIED
  FIELD7       CDATA        #IMPLIED
  FIELD8       CDATA        #IMPLIED
  FIELD9       CDATA        #IMPLIED
  FIELD10      CDATA        #IMPLIED

```

FIELD11	CDATA	#IMPLIED
FIELD12	CDATA	#IMPLIED
FIELD13	CDATA	#IMPLIED
FIELD14	CDATA	#IMPLIED
FIELD15	CDATA	#IMPLIED
FIELD16	CDATA	#IMPLIED
FIELD17	CDATA	#IMPLIED
FIELD18	CDATA	#IMPLIED
FIELD19	CDATA	#IMPLIED >

<!-- **CONTENT** incl. Statements, Decisions, Books, Multimedia, Objects, Email -->

<!-- **STATEMENT** is a textual note -->

<!ELEMENT	STATEMENT	EMPTY	>
<!ATTLIST	STATEMENT		
ID	ID	#REQUIRED	
NID	IDREF	#REQUIRED	
STATEMENT	CDATA	#REQUIRED	>

<!-- **DECISION** is a yes or no negotiation decision -->

<!ELEMENT	DECISION	EMPTY	>
<!ATTLIST	DECISION		
ID	ID	#REQUIRED	
NID	IDREF	#REQUIRED	
DECISION	CDATA	#REQUIRED	
RATIONALE	CDATA	#IMPLIED	>

<!-- **MULTIMEDIA** is a URL for a multimedia file -->

<!ELEMENT	MULTIMEDIA	EMPTY	>
<!ATTLIST	MULTIMEDIA		
ID	ID	#REQUIRED	
NID	IDREF	#REQUIRED	
MEDIUM	CDATA	#IMPLIED	
URL	CDATA	#REQUIRED	>

<!-- **OBJECT** is a URL for a Java object -->

<!ELEMENT	OBJECT	EMPTY	>
<!ATTLIST	OBJECT		
ID	ID	#REQUIRED	
NID	IDREF	#REQUIRED	
CLASS	CDATA	#IMPLIED	
URL	CDATA	#REQUIRED	>

<!-- **EMAIL** is an email message -->

<!ELEMENT	EMAIL	EMPTY	>
<!ATTLIST	EMAIL		

ID	ID	#REQUIRED
NID	IDREF	#REQUIRED
RECIPIENT	CDATA	#REQUIRED
SENDER	CDATA	#REQUIRED
SUBJECT	CDATA	#REQUIRED
THREAD	CDATA	#IMPLIED
CONTENT	CDATA	#REQUIRED >

<!-- **POSITION** is coordinates of a Node in a graphic display -->

<!ELEMENT	POSITION	EMPTY >
<!ATTLIST	POSITION	
ID	ID	#REQUIRED
NID	IDREF	#REQUIRED
PERSPECTIVE	IDREF	#REQUIRED
X	CDATA	#REQUIRED
Y	CDATA	#REQUIRED >

<!-- **TRANSACTION** is an event in a SPACE -->

<!ELEMENT	TRANSACTION	EMPTY >
<!ATTLIST	TRANSACTION	
ID	ID	#REQUIRED
TYPE	IDREF	#REQUIRED
PERSPECTIVE	IDREF	#REQUIRED
FROMNODE	IDREF	#REQUIRED
TONODE	IDREF	#IMPLIED
AUTHOR	IDREF	#REQUIRED
CREATED	CDATA	#REQUIRED >

]>

<!-- **following is some test data for the WebGuide XML DTD** -->

<!-- **this defines the information space with the test data** -->

```
<SPACE
  SID="sid1"
  NAME="Readings '99"
  DRIVER="JDBC"
  URL="http://webguide.cs.colorado.edu/"
  USERNAME="gerry"
  PASSWORD="*****"
  DBMS="mysql"
  COMMENT="for Spring Semester 1999 Seminar" >
```

<!-- **this Node defines the Node\_Kind "node\_kind"** -->

```
<NODE
  NID="nid1"
```

```
KIND="nid1"  
PERSPECTIVE="nid8"  
NAME="node_kind"  
DESCRIPTION="node_kind"  
AUTHOR="nid9"  
CREATED="05251999"  
></NODE>
```

<!-- **this Node defines the Node\_Kind "link\_type" -->**

```
<NODE  
  NID="nid2"  
  KIND="nid1"  
  PERSPECTIVE="nid8"  
  NAME="link_type"  
  DESCRIPTION="link_type"  
  AUTHOR="nid9"  
  CREATED="05251999"  
></NODE>
```

<!-- **this Node defines the Node\_Kind "perspective" -->**

```
<NODE  
  NID="nid3"  
  KIND="nid1"  
  PERSPECTIVE="nid8"  
  NAME="perspective"  
  DESCRIPTION="perspective"  
  AUTHOR="nid9"  
  CREATED="05251999"  
></NODE>
```

<!-- **this Node defines the Node\_Kind "author" -->**

```
<NODE  
  NID="nid4"  
  KIND="nid1"  
  PERSPECTIVE="nid8"  
  NAME="author"  
  DESCRIPTION="author"  
  AUTHOR="nid9"  
  CREATED="05251999"  
></NODE>
```

<!-- **this Node defines the Node\_Kind "statement" -->**

```
<NODE  
  NID="nid5"  
  KIND="nid1"  
  PERSPECTIVE="nid8"
```

```
NAME="statement"
DESCRIPTION="statement"
AUTHOR="nid9"
CREATED="05251999"
></NODE>
```

<!-- **this Node defines the Link\_Type "child" -->**

```
<NODE
  NID="nid6"
  KIND="nid2"
  PERSPECTIVE="nid8"
  NAME="child"
  DESCRIPTION="child"
  AUTHOR="nid9"
  CREATED="05251999"
></NODE>
```

<!-- **this Node defines the Link\_Type "add\_statement" -->**

```
<NODE
  NID="nid7"
  KIND="nid2"
  PERSPECTIVE="nid8"
  NAME="add_statement"
  DESCRIPTION="add_statement"
  AUTHOR="nid9"
  CREATED="05251999"
></NODE>
```

<!-- **this Node defines the Perspective "gerry's perspective" -->**

```
<NODE
  NID="nid8"
  KIND="nid3"
  PERSPECTIVE="nid8"
  NAME="gerry's perspective"
  DESCRIPTION="gerry's perspective"
  AUTHOR="nid9"
  CREATED="05251999"
></NODE>
```

<!-- **this Node defines the Author "gerry" -->**

```
<NODE
  NID="nid9"
  KIND="nid4"
  PERSPECTIVE="nid8"
  NAME="gerry"
  DESCRIPTION="gerry"
```



```
AUTHOR="nid9"
CREATED="05251999"
></NODE>
```

<!-- **this Node defines a Statement with name and description = "my first node" -->**

```
<NODE
  NID="nid10"
  KIND="nid5"
  PERSPECTIVE="nid8"
  NAME="my first node"
  DESCRIPTION="my first node"
  AUTHOR="nid9"
  CREATED="05251999"
></NODE>
```

<!-- **this Node defines a Statement with name and description = "my second node" -->**

```
<NODE
  NID="nid11"
  KIND="nid5"
  PERSPECTIVE="nid8"
  NAME="my second node"
  DESCRIPTION="my second node"
  AUTHOR="nid9"
  CREATED="05251999"
></NODE>
```

<!-- **this Node defines a Statement with name and description = "my third node" -->**

```
<NODE
  NID="nid12"
  KIND="nid5"
  PERSPECTIVE="nid8"
  NAME="my third node"
  DESCRIPTION="my third node"
  AUTHOR="nid9"
  CREATED="05251999"
></NODE>
```

<!-- **this Link defines a Child relation between Nodes nid10 and nid11 -->**

```
<LINK
  LID="lid1"
  TYPE="nid6"
  PERSPECTIVE="nid8"
  AUTHOR="nid9"
  CREATED="05251999" >
  <FLOCATOR
    HREF="nid10" >
```

```
        </FLOCATOR>
    <TLOCATOR
        HREF="nid11" >
    </TLOCATOR>
</LINK>
```

<!-- **this Link defines a Child relation between Nodes nid11 and nid12** -->

```
<LINK
    LID="lid1"
    TYPE="nid6"
    PERSPECTIVE="nid8"
    AUTHOR="nid9"
    CREATED="05251999" >
    <FLOCATOR
        HREF="nid11" >
    </FLOCATOR>
    <TLOCATOR
        HREF="nid12" >
    </TLOCATOR>
</LINK>
```

<!-- **this Statement defines an entry in the Statements table with text for Node nid10** -->

```
<STATEMENT
    ID="id1"
    NID="nid10"
    STATEMENT="my first node"
></STATEMENT>
```

<!-- **this Statement defines an entry in the Statements table with text for Node nid11** -->

```
<STATEMENT
    ID="id2"
    NID="nid11"
    STATEMENT="my second node"
></STATEMENT>
```

<!-- **this Statement defines an entry in the Statements table with text for Node nid12** -->

```
<STATEMENT
    ID="id3"
    NID="nid12"
    STATEMENT="my third node"
></STATEMENT>
```

<!-- **this Position defines an entry in the Positions table with coordinates for Node nid12** -->

```
<POSITION
    ID="id4"
    NID="nid12"
```

```
PERSPECTIVE =" nid8"  
X="37"  
Y="242"  
></POSITION>
```

<!-- **this Transaction defines an entry in the Transactions table for an add\_statement transaction** -->

```
<TRANSACTION  
  ID="tid1"  
  TYPE="nid7"  
  PERSPECTIVE="nid8"  
  FROMNODE="nid10"  
  AUTHOR="nid9"  
  CREATED="05251999"  
></TRANSACTION>
```

```
<TRANSACTION  
  ID="tid2"  
  TYPE="nid7"  
  PERSPECTIVE="nid8"  
  FROMNODE="nid11"  
  AUTHOR="nid9"  
  CREATED="05251999"  
></TRANSACTION>
```

```
<TRANSACTION  
  ID="tid3"  
  TYPE="nid7"  
  PERSPECTIVE="nid8"  
  FROMNODE="nid12"  
  AUTHOR="nid9"  
  CREATED="05251999"  
></TRANSACTION>
```

```
</SPACE>
```

### Backus-Naur Form (BNF)

[note: “**x-ref**” is a reference to the nid of a particular <node> of kind = **x**.]

<**space**> = <node> | <space> <node> | <space> <link> | <space> <detail> | <space> <position> | <space> <transaction>

<**node**> = int, kind-ref, perspective-ref, detail-ref, int, text, text, person-ref, timestamp, person-ref, timestamp

<**link**> = int, <link\_type>, perspective-ref, node-ref, node-ref, int, person-ref, timestamp

<**detail**> = <information> | <content>

<**link\_type**> = “edit” | “delete” | “deletelink” | “synonym” | “parent” | “isa” | “vcopy” | “vchild”

<information> = <person> | <group> | <table>  
 <content> = <statement> | <decision> | <book> | <multimedia> | <object> | <email>  
 <person> = int, node-ref, person-ref, text, perspective-ref  
 <group> = int, node-ref, text, text, perspective-ref, text, text, text, text, text, text, text, text, text, text, text, text  
 <table> = int, node-ref, int  
 <statement> = int, node-ref, text  
 <decision> == int, node-ref, (“yes” | “no”), text  
 <book> = int, node-ref, text, text, text, text, text, text, text, text, text, text  
 <multimedia> = int, node-ref, text, (*gif file url* | *jpeg file url* | *sound clip url* | *video clip url*)  
 <object> = int, node-ref, text, url  
 <email> == int, node-ref, text, text, text, text, text  
 <position> == int, node-ref, perspective-ref, int, int  
 <transaction> = int, type-ref, perspective-ref, node-ref, node-ref, person-ref, timestamp

## Relational Database Schema

### Spaces:

sid	int	unique link identifier, auto generated
name	char 100	
driver	char 100	
url	char 100	
username	char 100	
password	char 100	
dbms	char 100	
comment	char 255	

### Nodes:

nid	int	unique node identifier, auto generated
kind	int	nid of a node whose kind = “node_kind”
perspective	int	nid of a node whose kind = “perspective”
suptable	int	nid of a node whose kind = “suptable”

content	int	id of a record in above table
name	char 100	title or name of node
description	char 255	textual content of node, up to first 255 characters
author	int	nid of a node whose kind = "person"
created	timestamp	node creation time and date
editor	int	nid of a node whose kind = "person"
modified	timestamp	node last modification time and date

**Links:**

lid	int	unique link identifier, auto generated
type	int	nid of a node whose kind = "link_type"
perspective	int	nid of a node whose kind = "perspective"
fromnode	int	nid of a node
tonode	int	nid of a node
seq	int	sequence number of to under from
author	int	nid of a node whose kind = "person"
created	timestamp	node creation time and date

**People:**

id	int	unique link identifier, auto generated
nid	int	nid of a node whose kind = "person"
username	char 20	
password	char 20	
perspective	int	nid of a node whose kind = "perspective"
fullname	char 100	
first	char 20	
middle	char 20	
last	char 20	
email	char 100	
homepage	char 255	
gender	char 4	
favorite_color	char 20	

work_place	char 100	
work_title	char 100	
home_phone	char 20	
work_phone	char 20	

**Groups:**

id	int	unique link identifier, auto generated
nid	int	nid of a node whose kind = "group"
perspective	int	nid of a node whose kind = "perspective"
representative	int	nid of a node whose kind = "person"
password	char 20	
email	char 255	

**Tables:**

id	int	unique link identifier, auto generated
nid	int	nid of a node whose kind = "table"
field0	int	code for type of field in this user-defined table
field1	int	
field2	int	
field3	int	
field4	int	
field5	int	
field6	int	
field7	int	
field8	int	
field9	int	
field10	int	
field11	int	
field12	int	
field13	int	
field14	int	
field15	int	

field16	int	
field17	int	
field18	int	
field19	int	

### Statements:

id	int	unique link identifier, auto generated
nid	int	nid of a node whose kind = "statement"
statement	text	

### Decisions:

id	int	unique link identifier, auto generated
nid	int	nid of a node whose kind = "decision"
decision	char 100	
rationale	text	

### Books:

id	int	unique link identifier, auto generated
nid	int	nid of a node whose kind = "book"
author	char 100	
year	char 4	
title	char 100	
editor	char 100	
journal	char 100	
issue	char 4	
location	char 100	
url	char 255	
description	text	
abstract	text	
keywords	char 255	

### Multimedia:

id	int	unique identifier, auto generated
----	-----	-----------------------------------

nid	int	nid of a node whose kind = "multimedia"
medium	char 100	"page"   "image"   "search"   "sound"   "video"   . . . .
url	char 255	URL of a multimedia file

**Objects:**

id	int	unique identifier, auto generated
nid	int	nid of a node whose kind = "object"
class	char 100	
url	char 255	URL of a Java object

**Email:**

id	int	unique identifier, auto generated
nid	int	nid of a node whose kind = "email"
recipient	char 255	
sender	char 255	
subject	char 255	
thread	char 255	
content	text	

**Positions:**

id	int	unique position identifier, auto generated
nid	int	nid of a node
perspective	int	perspective in which node has this position
x	int	x coordinate in pixels
y	int	y coordinate in pixels

**Transactions:**

id	int	unique transaction identifier, auto generated
type	int	type of event
perspective	int	
fromnode	int	
tonode	int	
author	int	



created	timestamp	
---------	-----------	--

## MySQL Table Creation Commands

### Spaces

```
"create table spaces ( sid bigint(21) DEFAULT '0' NOT NULL auto_increment, name
varchar(100), driver varchar(100), url varchar(100), username varchar(100), password
varchar(100), dbms varchar(100), comment varchar(255), PRIMARY KEY (sid) );"
```

### Nodes

```
"create table nodes ( nid bigint(21) DEFAULT '0' NOT NULL auto_increment, kind bigint(21)
DEFAULT '0' NOT NULL, perspective bigint(21) DEFAULT '0' NOT NULL, suptable
bigint(21) DEFAULT '0' NOT NULL, content bigint(21), name varchar(100), description
varchar(255), author bigint(21), created timestamp(14), editor bigint(21), modified
timestamp(14), PRIMARY KEY (nid), KEY (kind), KEY (perspective), KEY (table) );"
```

### Links

```
"create table links ( lid bigint(21) DEFAULT '0' NOT NULL auto_increment, type bigint(21)
DEFAULT '0' NOT NULL, perspective bigint(21)DEFAULT '0' NOT NULL, fromnode
bigint(21) DEFAULT '0' NOT NULL, tonode bigint(21)DEFAULT '0' NOT NULL, seq int(11),
author bigint(21), created timestamp(14), PRIMARY KEY (lid), KEY (type), KEY
(perspective), KEY (from), KEY (to) );"
```

### People

```
"create table people ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21),
username varchar(20), password varchar(20), perspective bigint(21), fullname varchar(100), first
varchar(20), middle varchar(20), last varchar(20), email varchar(100), homepage varchar(255),
gender varchar(4), favorite_color varchar(20), work_place varchar(100), work_title
varchar(100), home_phone varchar(20), work_phone varchar(20), PRIMARY KEY (id) );"
```

### Groups

```
"create table groups ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21),
password varchar(20), representative bigint(21), email varchar(255), home_perspective
bigint(21), PRIMARY KEY (id) );"
```

### Tables

```
"create table auxtables ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21)
DEFAULT '0' NOT NULL, field0 int(11), field1 int(11), field2 int(11), field3 int(11), field4
int(11), field5 int(11), field6 int(11), field7 int(11), field8 int(11), field9 int(11), field10 int(11),
field11 int(11), field12 int(11), field13 int(11), field14 int(11), field15 int(11), field16 int(11),
field17 int(11), field18 int(11), field19 int(11), PRIMARY KEY (id), KEY (nid) );"
```

## Statements

```
"create table statements ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid
bigint(21), statement text, PRIMARY KEY (id) );"
```

## Decisions

```
"create table decisions ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21),
decision varchar(100), rationale text, PRIMARY KEY (id) );"
```

## Books

```
"create table books ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21),
author varchar(100), year varchar(4), title varchar(100), editor varchar(100), journal
varchar(100), issue varchar (4), location varchar (100), website varchar (255), description text,
abstract text, keywords varchar (255), PRIMARY KEY (id) );"
```

## Multimedia

```
"create table multimedia ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid
bigint(21), medium varchar(100), url varchar(255), PRIMARY KEY (id) );"
```

## Objects

```
"create table objects ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21),
class varchar(100), url varchar(255), PRIMARY KEY (id) );"
```

## Email

```
"create table email ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21)
DEFAULT '0' NOT NULL, recipient varchar(255), sender varchar(255), subject varchar(255),
thread varchar(255), content text, PRIMARY KEY (id) );"
```

## Positions

```
"create table positions ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, nid bigint(21)
DEFAULT '0' NOT NULL, perspective bigint(21) DEFAULT '0' NOT NULL, x bigint(21)
DEFAULT '0' NOT NULL, y bigint(21)DEFAULT '0' NOT NULL );"
```

## Transactions

```
"create table transactions ( id bigint(21) DEFAULT '0' NOT NULL auto_increment, type
bigint(21) DEFAULT '0' NOT NULL, perspective bigint(21)DEFAULT '0' NOT NULL,
fromnode bigint(21) DEFAULT '0' NOT NULL, tonode bigint(21)DEFAULT '0' NOT NULL,
author bigint(21), created timestamp(14), PRIMARY KEY (id), KEY (type), KEY (perspective),
KEY (from), KEY (to) );"
```